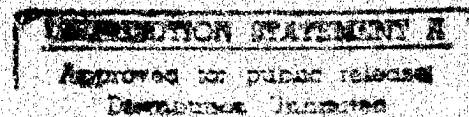


March 1997

DEPARTMENT OF  
ENERGYManagement and  
Oversight of Cleanup  
Activities at Fernald

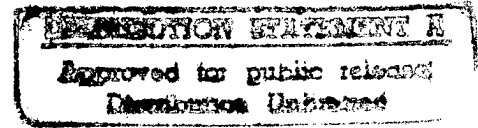
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Resources, Community, and  
Economic Development Division

B-276108

March 14, 1997

Congressional Requesters



Over 50 articles containing allegations of mismanagement and safety violations at the Department of Energy's (DOE) Fernald site in Ohio appeared in the Cincinnati Enquirer last year. Located about 18 miles from Cincinnati, the Fernald site is undergoing the cleanup of contamination from its former uranium metal production activities. DOE has entered into an initial 5-year, \$1.9 billion contract with Fluor Daniel Fernald<sup>1</sup> to clean up the site. The contract to continue the cleanup will be up for a 1- to 3-year renewal in November 1997. DOE estimates that it will take an additional 13 years and about \$2.4 billion to complete the cleanup. The seriousness of the allegations prompted both DOE and Fluor Daniel Fernald to create two ad-hoc groups to investigate the situation.

Concerned about the implications that the allegations might have for the management and oversight of the site, you asked us to report on (1) the extent to which DOE is providing effective management and oversight of two key cleanup projects at Fernald—the vitrification pilot plant project and the uranyl nitrate hexahydrate project—that were reported on in the Cincinnati Enquirer, (2) DOE's oversight of safety and health activities at the site, and (3) the contractor's compliance with certain performance and financial system procedures. In this connection, you also asked us to provide you with information concerning DOE's overall contracting and management initiatives and how they may resolve any problems identified at Fernald.

In addition, you asked for information on the major allegations and what is known about them, including the results of the two primary investigations of the allegations in each of these areas.<sup>2</sup> (This information is discussed in apps. I, II, and III.) You also asked for information on the facts surrounding Fluor Daniel Fernald's recent announcement that 12 to 15 years may be necessary to complete the cleanup, rather than the previously agreed-upon 10-year time frame. (See app. IV.)

<sup>1</sup>Until September 1996, the company was known as the Fernald Environmental Restoration Management Corporation.

<sup>2</sup>We also provided opportunities for individuals to contact us anonymously regarding any concerns (see apps. III and V).

## Results in Brief

DOE has not exercised adequate management and oversight of the vitrification and uranyl projects or of the contractor's safety and health activities. In addition, the contractor has not complied with some required procedures in maintaining its major performance and financial systems. As a result of these weaknesses, costs have increased, schedules have slipped, and safety and health risks exist. The following are examples:

- DOE provided limited oversight during the early stages of the two projects and did not prepare many of the required project management documents for the uranyl project. These and other DOE oversight weaknesses contributed to a total of \$65 million in estimated cost overruns and almost 6 years of schedule slippages for the two projects. These problems are characteristic of other major projects implemented by DOE contractors at other sites.
- From 1993 to 1995, serious safety and health concerns were raised about DOE's ability to ensure the contractor's compliance with safety and health requirements. For example, DOE did not have adequate plans to supervise the contractor's activities and was not conducting the required safety and health assessments. As noted in a May 1996 DOE report, DOE has improved its safety and health oversight at Fernald. However, continued weaknesses limit DOE's ability to ensure that the contractor is adhering to requirements. They include weak planning of formal inspections and weak processes for ensuring that identified safety problems are adequately corrected.
- Some of the contractor's practices for maintaining the performance and financial systems make it difficult for DOE and the contractor to exercise effective control and oversight of the contractor's costs and activities. For example, the contractor's requests to change the cost and schedule baseline, on which the contractor's performance is based, do not always provide the required information for DOE's approval. In addition, charges are routinely made to closed financial accounts and accounts are routinely reopened without the responsible account managers' knowledge. Consequently, assurance that only appropriate costs are being charged to accounts is weakened.

DOE has made some improvements in these areas. For example, in project management, DOE has increased the frequency with which it meets with the contractor to discuss the status of its most important projects. In the safety and health area, DOE has increased the number of assessments and is making other changes that are not far enough along to evaluate. Finally, DOE has directed the contractor to make changes to address weaknesses identified in recent reviews of the contractor's financial and performance

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management, but it is too early to assess their impact. These actions address some of the weaknesses we identified.

DOE recognizes that contracting and management problems exist throughout the Department and is implementing major reforms to change the way it does business at Fernald and other sites. For example, DOE has published a contracting policy adopting a standard of full and open competition, developed strategic goals for the Department, and issued new requirements for managing major projects. It is too soon to assess the overall effectiveness of these reforms. Their implementation at Fernald will be a real test of DOE's reforms.

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## Background

After 36 years of using chemical and mechanical processes to produce slightly enriched uranium from ore, DOE's Fernald site is faced with a variety of environmental problems. As with other sites in DOE's nuclear weapons complex, an emphasis on production versus safety has produced a legacy of contaminated radioactive and hazardous wastes at storage sites, in buildings that are deteriorating, or in seepage to underground water supplies.

Also, as with other DOE sites, contract management has been an ongoing problem. Stemming from the special contracting arrangements for the development of the atomic bomb during World War II, DOE continued with lax oversight of contractors of the weapons complex for decades. For this reason, in 1990 we designated DOE's contracting as a high-risk area vulnerable to waste, fraud, abuse, and mismanagement and have issued numerous reports and testimonies that provided an impetus for change.<sup>3</sup>

The responsibility for the management and oversight of Fernald's cleanup rests with two units at DOE's headquarters—the Office of Environmental Management manages the technical, financial, and overall safety aspects of the cleanup, while the Office of Environment, Safety, and Health conducts periodic reviews to independently evaluate safety and health programs at the site. At the field level, DOE's Ohio Field Office and Fernald Area Office provide the planning, budgeting, and oversight of cleanup activities. Fernald Area Office staff interact daily with Fluor Daniel Fernald staff, who either directly or through subcontractors actually conduct the cleanup.

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<sup>3</sup>As reported in Department of Energy: Contract Reform Is Progressing, but Full Implementation Will Take Years (GAO/RCED-97-18, Dec. 10, 1996) and High-Risk Series: DOE Contract Management (GAO/HR-97-13, Feb. 1997).

As one of the first former weapons sites to be completely shut down—temporarily in 1989 and permanently in 1991—Fernald, in 1992, became one of the sites to pilot test a new contracting concept called the environmental restoration management contractor. DOE wanted to bring in new contractors, such as Fluor Daniel Fernald, that were experienced in environmental restoration to focus solely on the management and oversight of the cleanup. The actual cleanup was expected to be carried out by subcontractors. In addition, Fernald was one of the first DOE cleanup sites to propose accelerating its schedule for completing work at the site from 25 to 10 years.

The management of the site's activities has been complicated by reductions in the contractor's workforce, DOE's downsizing, and budget pressures common to other DOE sites. In 1993, shortly after Fluor Daniel Fernald assumed full responsibility for the site's activities, DOE began a workforce reduction at the site to better match employees' skills with Fernald's cleanup needs. As a result, about 250 company and subcontractor employees were released, and 62 employees retired or resigned. These separations caused unrest and concerns among the remaining employees.

For its part, DOE has not fully staffed the Fernald Area Office. From February 1992, when DOE established Fernald as a field office, through March 1994, when DOE proposed staffing for the newly created Ohio Field Office, DOE decreased Fernald's staffing authorization from 190 to 82.<sup>4</sup> At the time, DOE officials at Fernald had hired 72 individuals. After transferring positions and staff to the Ohio Field Office, Fernald was left with 39 individuals and an authorized staff level of 68. By April 1996, DOE had decreased Fernald's authorized staff level to 53 and had 47 individuals on board at the site.

## Limited Management Oversight of Projects Has Contributed to Cost Growth and Schedule Delays

DOE's limited oversight early in the two key cleanup projects we reviewed contributed to cost increases and schedule slippages that mirror problems we have identified across DOE. The two projects cited in the Cincinnati *Enquirer* are (1) the vitrification pilot plant project to confirm the feasibility of converting 20 million pounds of low-level radioactive waste into a glass-like form for disposal and (2) the uranyl nitrate hexahydrate (uranium ore dissolved in nitric acid) project to process and dispose of about 200,000 gallons of the substance. From a budget perspective, these

<sup>4</sup>DOE's Oak Ridge Operations Office was responsible for managing the Fernald site prior to November 1993.

two projects represent about 5 percent of the site's funding for fiscal years 1993 through 1996. The vitrification and uranyl projects are of similar size and complexity as some of the projects that DOE will undertake in the future.

For the vitrification project, which is still ongoing, the estimated schedule to complete the testing of the waste has slipped 19 months, from March 1996 to October 1997. The original cost estimate in February 1994 was \$14.1 million. This estimate did not include the costs for operating, maintaining, decontaminating, and decommissioning the plant. By December 1994, when DOE included operating costs in the estimate, DOE increased the projects to about \$20.6 million, assuming that a key part of the facility—the melter used to superheat waste material—could operate at 100-percent efficiency. In July 1996, the estimate increased to \$56 million, reflecting cost overruns in the initial estimates, and a more conservative estimate of 33-percent operating efficiency was made for the melter, as well as operating, maintaining, decontaminating, and decommissioning costs. As of September 1996, the estimate was \$66 million. For the uranyl project, the original estimates made in fiscal year 1990 increased from \$750,000 to more than \$16.8 million and from 7 months to about 5 years for the project's completion.<sup>5</sup>

DOE officials believe that (1) the Department's deliberate policy of relying on the technical and managerial expertise of its new environmental restoration and management contractor to accomplish cleanup objectives and (2) the technical complexity of the vitrification project led to many of the Department's subsequent problems with the projects. Although we agree that these factors contributed to the projects' problems, other actions and decisions by DOE and the contractor helped cause the projects' cost increases and delays.

In fact, the projects suffered from several management and oversight weaknesses. For example, DOE had limited involvement during the early design and procurement stages of the vitrification plant and could have avoided major problems if it had exercised more oversight of the contractor's early decisions. In addition, DOE and the contractor decided early on to accelerate the pace of this project without having fully tested the feasibility of the technology and underestimated the technical complexity of this first-of-a-kind project. DOE also allowed concurrent design and construction at the vitrification plant, which resulted in

<sup>5</sup>The \$16.8 million represents funds spent from fiscal year 1993 through February 1996. DOE estimated that the Department spent an additional \$400,000 from fiscal year 1990 through fiscal year 1992 for repackaging, surveillance, and maintenance of UNH and other nuclear materials at the site.

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increased costs and schedule delays. Because the contractor built interfacing systems for a piece of equipment still in the design phase, about 225 design changes had to be made when the final components of the equipment differed from their preliminary designs. For the uranyl project, many of the required project management documents were not prepared until late or not prepared at all, contributing to the cost growth and schedule delays. For example, because a technical information plan was not prepared until late in the project, significant work was not done according to DOE's requirements.

As a result of a December 1995 DOE study of the problems at the vitrification plant and preliminary evaluations of alternatives to the current vitrification strategy, DOE has decided to postpone the additional construction and testing of radioactive material at the plant and to convene a panel of experts to reexamine the Department's strategy for cleaning up the area. DOE expects that by June 1997, the Department and its stakeholders will reach a consensus on the appropriate cleanup strategy for the area. Furthermore, for its most important projects, DOE has increased the frequency with which it meets with the contractor to discuss the status of the projects.

Cost overruns and schedule slippages similar to those of these two projects exist Departmentwide. They occurred in most of the 80 major systems acquisitions conducted across DOE from 1980 through 1996, one of which is the Fernald Environmental Management Program.<sup>6</sup> Over the years, we and DOE's Inspector General have reported that cost and schedule overruns on DOE's major acquisitions have occurred for a number of reasons, including technical problems, poor initial cost estimates, and the ineffective oversight of contractors' operations. Furthermore, we reported that underlying the problems were, among other things, a lack of sufficient DOE personnel with the appropriate skills to effectively oversee contractors' operations and a flawed system of incentives both for DOE's employees and contractors.<sup>7</sup>

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<sup>6</sup>DOE defines major systems acquisitions as projects that are important to DOE's missions and will cost a total of at least \$100 million.

<sup>7</sup>Department of Energy: Opportunity to Improve Management of Major System Acquisitions (GAO/RCED-97-17, Nov. 26, 1996).

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## Despite Some Progress, Weaknesses Remain in Oversight of Safety and Health

As noted in a May 1996 report by DOE, the Fernald Area Office has made progress in its oversight of safety and health. However, the Area Office is still not complying with some oversight-related requirements and is in the early stages of planning changes to its program that may better address these requirements. However, because the plans have not been fully implemented, it is too early to assess whether they will fully comply with DOE's standards and guidance.

The ongoing decontamination and decommissioning activities at Fernald involve radioactive hazards, such as contaminated facilities and nearly 16 million pounds of stored uranium, as well as chemical hazards, such as acids and process waste. To minimize the risks of potential hazards to the workers and the public, DOE requires the contractor to comply with numerous safety and health standards. They include radiation protection of workers and the public, nuclear criticality safety, and occupational safety and health, among others.

The Fernald Area Office is responsible for overseeing the contractor's compliance with the safety and health requirements. The Area Office's oversight activities include, among other things, formal assessments of the contractor's processes, surveillance of items or activities, and walk-throughs to observe conditions in the site's facilities. The Area Office's facility representatives are responsible for monitoring the performance of the site's facilities and serve as DOE's primary points of contact with the contractor.

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## Little Formal Oversight Existed Prior to 1995

Although many of the safety and health allegations in the Cincinnati Enquirer overstated the situation at Fernald (see app. II), the site did have serious problems. From 1993 to 1995, the Defense Nuclear Facilities Safety Board and DOE's headquarters offices raised serious concerns regarding the Fernald Area Office's ability to ensure the contractor's compliance with DOE's safety and health requirements. For example, the Board found in 1992 and 1993 that the Area Office had inadequate plans to supervise the contractor's activities, did not have the technical staff to ensure that safety requirements were adhered to, and did not stay on top of the daily activities of the contractor. The Board made several recommendations to correct these problems.

DOE's Office of Environmental Management found in 1994 that the program for assessing operations at the site was unsatisfactory for a number of reasons. For example, the Area Office was not conducting required



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assessments, did not systematically follow up on prior assessments, and did not transmit the results of assessments to the contractor.

Two 1995 reports identified safety and health problems. The first report by DOE, Fluor Daniel Fernald, and consultants stated that an emphasis on meeting projects' target dates at Fernald contributed to a breakdown in contamination control and an increase in personnel contaminations in July and August 1995. The other report by the Office of Environment, Safety, and Health stated that the Area Office's oversight program lacked "the structure and resources necessary to validate the adequacy of the contractor's operational safety and health program." Specifically, the Area Office had not developed procedures for implementing its safety and health responsibilities, line managers did not conduct routine walk-throughs of Fernald facilities, and the Area Office did not have a formalized system for tracking and showing trends in the status of safety problems it had identified.

The low level of oversight activity in 1993 and 1994, according to the Associate Director for Safety and Assessment in the Fernald Area Office, was partly due to confusion over the level of oversight that DOE should exercise over the new environmental restoration management contractor and the change in primary responsibility for oversight from the Oak Ridge Field Office to the Fernald Area Office.

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### DOE's Oversight of Contractor's Activities Has Improved

As a result of these reviews, the Fernald Area Office has made a number of improvements over the years in its oversight of the contractor's safety and health activities. For example, the Area Office developed a technical management plan for Fernald that outlined a detailed program for ensuring the contractor's compliance with DOE's safety and health requirements. The Office also established a group of facility representatives to monitor daily activities at the site and initiated a qualification program for these staff. The Office also increased the number of safety and health assessments from 1 in fiscal year 1993 to 15 in fiscal year 1996 and the number of surveillances from zero to 14.

The site's record of persons contaminated by radiation is an indicator of improvement in DOE's oversight program. Although Fernald had 69 contamination occurrences from January 1, 1993, through February 12, 1996, several later assessments by DOE found that the radiological control program had improved. One DOE review compared Fernald's personnel contamination events per 100 staff years with similar events at other

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comparable DOE remediation sites. The review concluded that while the type and number of occurrences indicated weaknesses in Fernald's program, the rate of occurrence was not excessive when compared with that of other remediation sites.

DOE's and the contractor's responses to correct a recently disclosed safety and health problem at the site is yet another indicator of improvements in the area. After a February 1996 surveillance by the contractor identified, among other things, that some inspection records of hazardous and radioactive wastes were missing, DOE and the contractor agreed in April 1996 to ensure that compliance personnel would perform weekly checks of the hazardous waste areas and examine records to ensure that inspections were performed and documented.

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### Some Oversight Requirements Are Not Being Met

Some recommended improvements in safety and health oversight have just been completed, but other aspects of the Fernald Area Office's oversight still do not meet DOE's safety and health standards and guidance. For example, in spite of a June 1993 Defense Board recommendation to immediately establish a group of technically qualified facility representatives, as of May 1996, only one out of six appointed representatives had completed the basic qualification requirements, and not until November 1996 did four more representatives complete the requirements. In addition, despite a 1995 DOE recommendation to track and trend identified problems and corrections, the Fernald Area Office is just now implementing a computerized system to do so.

Furthermore, the Area Office did not fully implement its plan for assessments that it must perform in some areas, such as waste management and occupational medical programs until fiscal year 1997, according to DOE. The Area Office also has not developed an assessment schedule for its facility representatives or a surveillance schedule for its other oversight staff. In addition, the Area Office has not developed guidelines for performing walk-throughs of facilities by DOE facility representatives. Such schedules and guidelines are intended to ensure the conduct of comprehensive and systematic reviews of all aspects of facility operations over an established period of time.

Furthermore, although a lack of formal reporting is contrary to DOE's standards and procedures, facility representatives generally do not formally document their findings. The purpose of this reporting is to transmit the findings and follow-up items from surveillances and

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walk-throughs to the contractor's and Area Office's managers. Yet, the representatives usually relay their findings verbally.

DOE's Fernald Area Office is either in the process of making changes to its oversight program to correct these weaknesses or plans to do so. Because the efforts are not complete, it is too early to assess how well the efforts will correct the weaknesses.

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## Some Weaknesses Exist in Performance and Financial Systems

Fluor Daniel Fernald's compliance with procedures that we reviewed in the performance and financial systems was mixed, but some weaknesses make it difficult for both DOE's and the contractor's managers to exercise effective control and oversight of the contractor's costs and performance. These weaknesses include such problems as incomplete documentation for changing the contractor's cost and schedule baseline, on which the contractor's performance is based, and inadequate control of the opening and closing of financial accounts to ensure that only appropriate charges are made to them. DOE has directed the contractor to make numerous changes to address the weaknesses identified in recent reviews of the contractor's financial and performance management, but it is too early to assess the impact.

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## Weaknesses Exist in Documentation and Approval Procedures to Change the Baseline

In some cases, the procedures for maintaining and updating the performance measurement baseline were not followed, while in other cases the current procedures are limited or unclear. The baseline governs the expenditure of the site's budget, which was about \$266 million in fiscal year 1997, and defines what work has been authorized. The baseline is the standard against which DOE assesses the contractor's cost and schedule performance. The baseline is approved by the Fernald Area Office and can be adjusted to reflect changes that are not under the contractor's control, such as a change in the authorized level of funding or changes in costs due to amended labor rates. DOE's and the contractor's procedures define when and how the baseline is adjusted. When the contractor wants to change the baseline, a control account manager prepares a proposal to change it. The required level of approval for the change depends on the magnitude of the change.

On the basis of our random sample of 176 baseline change proposals,<sup>8</sup> the contractor complied with most but not all of the site's written procedures for controlling the baseline. For example, the contractor had maintained

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<sup>8</sup>See appendix V for more detailed information on our baseline change control sample.

the required records that described and justified a proposed change for all but one of the randomly selected change proposals that we reviewed. The documentation was usually adequate to support the need for changing the baseline, except that in some cases, the required information on the impact of changes on site activities was not well documented. In addition, we estimated that for about 12 percent of the proposals,<sup>9</sup> the documentation did not include the required source of funding for the change as required by the procedures.

In some cases, DOE's and the contractor's written procedures for maintaining and updating the baseline are unclear and do not facilitate the efficient review and approval by management of either organization. For example, neither the contractor's nor the Area Office's written procedures require that if a proposal is disapproved, the reasons for disapproval be formally documented on the proposal form. The procedures also do not require that the contractor clearly mark documents that support change proposals in order to indicate differences between the current approved baseline and the proposed change. The lack of such documentation inhibits the subsequent review or oversight of proposed changes.

As for requirements for the approval of change proposals, DOE's and the contractor's procedures for designating which level within each organization should approve change proposals do not clearly define the criteria for determining the approving officials. Although one of the criteria for determining approval levels is the amount of funds involved in the change, the procedures do not clearly define whether the criteria should be the net change in funds over 1 year or over several years. Because Area Office and contractor officials can interpret the criteria differently, change proposals that involve moving similar amounts of funds among activities may be approved at different levels within the organizations.

The incompleteness of the formal documentation highlights the degree to which the Fernald Area Office's management relies on informal and verbal communications to support decision-making. The current procedures and quality of information do not facilitate DOE's oversight process and also do not provide a complete official record for subsequent internal or external review.

<sup>9</sup>Because the information for the baseline change proposals was developed from a statistical sample, the estimates have a measurable precision or sampling error. Appendix V provides the sampling error for the estimate cited.

## Controls Over Accounts Are Not Always Adequate

In controlling financial accounts, some charges are posted to accounts after they have been closed, and the required approvals for opening and closing accounts are not always obtained. These practices make it difficult for DOE's and the contractor's managers to exercise effective control and oversight of the contractor's costs and performance. The contractor processes several hundred thousand financial transactions each year to accumulate the costs in its accounts. Accounts are opened to allow costs for specific work to be charged against the appropriate account and closed when all related charges have been made to the account. Procedures require that the contractor's control account managers, who are responsible for managing accounts and verifying the accuracy of charges, perform the opening and closing functions to ensure that a person knowledgeable about the scope of work and the related costs monitors and controls the charges that are made against the account.

Nearly all charges in the contractor's financial system occurred when the accounts were properly opened in compliance with standard procedures. However, a small percentage of the charges were routinely made to accounts after the control account managers had closed them, making the effective control of the accounts difficult. This percentage averaged from 1 to 2 percent of the several hundred thousand charges that Fluor Daniel Fernald processes annually to accumulate costs in its authorized accounts. The system will accept charges to closed accounts, according to contractor officials, to allow for certain adjustments to be made, such as the allocation of sales tax to an account, which is posted monthly rather than after each invoice.

In addition to allowing charges to be made to closed accounts—without reopening them—the contractor's financial system allowed some accounts to be reopened for charges without the required control account manager's approval. On the basis of our random sample of 87 control accounts and their associated 239 charge numbers, we estimate that 46 percent of the contractor's accounts were missing at least one of the documents required to open or close the account.<sup>10</sup> Furthermore, some control account managers we interviewed said they were unaware that their accounts had been reopened until after they saw new charges appear in the accounts. Making charges to closed accounts and reopening accounts without the control account managers' awareness and approval make it difficult for the managers to effectively control what is charged to their accounts and thus ensure the accuracy of the cost data that DOE uses to make payments to the contractor.

<sup>10</sup>See appendix V for detailed information on the control account sample and the sampling error rate.

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## DOE Is Implementing Contract and Management Initiatives to Improve Oversight

DOE recognizes that its management and contracting problems are Departmentwide and is implementing major reform efforts to improve these areas. For example, in contracting, a DOE team that was established in 1993 to evaluate the Department's contracting practices recommended 48 actions to fundamentally change the Department's way of doing business. In stark contrast to its historical contracting patterns, DOE has published a policy adopting a standard of full and open competition, developed guidance for contract performance criteria and measures, created incentive mechanisms for contractors, and developed training in performance-based contracting for DOE personnel.

DOE also has several initiatives under way that could help the Department better manage its affairs. For example, DOE has developed strategic goals to guide the Department and contractors; defined new requirements for managing major assets throughout their life-cycle; and is evaluating revisions to its management, financial, and business information systems to provide managers with more consistent and accurate information on their projects and budgets.

DOE's Fernald site is participating in many of these contracting and management initiatives. However, because the Fernald contract was executed prior to most of DOE's contract reform initiatives, it will take time for these new initiatives to be formalized into DOE's relationship with the contractor at Fernald. The test of DOE's success will occur as DOE implements and monitors the broad changes it is making, awards new contracts for managing its sites, and fine-tunes existing contracts to improve contractors' performance. At Fernald, DOE must decide by November 30, 1997, whether to extend Fluor Daniel Fernald's contract for an additional 3 years or competitively award it.

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## Conclusions

At Fernald, weaknesses existed in DOE's management and oversight of the cleanup projects we reviewed, in DOE's development of a safety and health oversight program, and in the contractor's implementation of procedures for key financial and performance systems. Although DOE has already taken some actions to respond to the findings of recent reviews, some problems still remain unaddressed or need further action. Left uncorrected, these weaknesses could increase the cost, timing, and safety and health risks of cleaning up the Fernald site.

The expiration of DOE's current contract with Fluor Daniel Fernald provides an opportune time for DOE to strengthen the specific oversight

weaknesses we identified. The contract's expiration also will provide a test of the implementation of DOE's contract reform initiatives. DOE can demonstrate the effectiveness of its incentive mechanisms and contract performance criteria and measures, its commitment to a policy of full and open competition, and the effects of its training of DOE personnel in performance-based contracting.

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## Recommendations

In view of the approaching expiration of the contract with Fluor Daniel Fernald, we recommend that the Secretary of Energy ensure that (1) the contract reform initiatives that DOE has undertaken are fully integrated into the Fernald contract and that (2) the Area Office strengthen its oversight at Fernald in order to correct the project management, safety and health program, and performance and financial system weaknesses that we have identified.

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## Agency Comments and Our Evaluation

We provided a draft of this report to DOE for its review and comment, and DOE provided its comments in a letter and two enclosures. DOE's letter and enclosure I contain the Department's overall comments, its response to our recommendations, and DOE's major concerns regarding our presentation of the allegations, management and oversight of the two projects we reviewed, safety and health oversight, and compliance with performance and financial system procedures (see app. VI). This section of the report contains our response to those comments. DOE's enclosure II, which is not included in this report, contains more detailed comments that we incorporated into the report as appropriate.

Overall, DOE plans to take actions related to our report recommendations. DOE says it will convene a panel to consider the opportunity to integrate additional contract reform initiatives into the next Fernald contract and will continue to focus attention on and strengthen oversight of the contractor's activities.

DOE had four major concerns with our draft report. First, DOE was concerned that our report did not bring closure to what DOE characterized as the two key issues raised by the allegations—the Cincinnati Enquirer's broad conclusions that the site has jeopardized the safety of site workers and neighbors and that the government is being systematically cheated out of millions of dollars. The scope and objectives of our work, however, were not so broad that we could either validate or dismiss the conclusions drawn from the allegations. Rather, our work points out specific

weaknesses that exist in both the safety and health and financial areas that diminish the assurance that safety is adequately addressed and costs are adequately controlled at Fernald. For example, weak processes exist for ensuring that identified safety problems are adequately corrected, and failure to correct such deficiencies present safety risks to workers and the public. In controlling financial accounts, some charges are posted to accounts after they have been closed, and the required approvals for opening and closing accounts are not always obtained. These practices make it difficult for DOE and the contractor's managers to exercise effective control and oversight of the contractor's costs and performance.

Second, with regard to the oversight and management of two key cleanup projects at Fernald—the vitrification pilot plant and the uranyl nitrate hexahydrate project—DOE generally did not dispute the lack of oversight or the cost and schedule increases, but it did disagree with the reasons for them. DOE cited the transition to the new environmental restoration management contract at Fernald and the technical complexities of the project. We agree that DOE's approach for implementing the new contracting concept contributed to DOE's initial limited oversight of the project and have added language to the report to this effect. We also agree that the vitrification project was technically complex. However, we continue to believe, as stated in our report, that other factors, such as DOE and the contractor's decisions to accelerate the pace of the project and the contractor's decision to allow concurrent design and construction of key parts of the plant also contributed to the delays and cost increases.

Third, DOE disagrees with our characterization of the weak safety and health oversight program from 1992 to 1995 and the representation of the present program as continuing to have weaknesses. DOE maintains that it has shown continuous improvement in its safety and health oversight program since 1992 and that a 1996 DOE review reported that the program was effective. We agree that DOE has made improvements and recognize that in our report. However, prior to 1995, DOE demonstrated little formal oversight, with most of the improvements occurring more recently. In addition, we acknowledge in our report that the 1996 review found the program to be effective. However, the DOE report also identified numerous weaknesses which we also acknowledge, such as the many unstructured and informally documented activities of the facility representatives which are subsequently not useful for tracking and trending safety problems.

Fourth, DOE stated that appendix III of our report showed that there was no evidence to the allegation that charges were made to cost accounts



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with no budget and that the tests we conducted showed that the accounting system was functioning properly. In addition, DOE cited two reviews that it believes indicate that the performance system is performing adequately and that strong controls exist over selected financial activities. We did not perform the type of testing that would allow us to say that no unauthorized work was performed or that all charges in the accounting system were valid. For example, we reviewed only selected control accounts, which did not constitute a statistically valid sample. In addition, while our testing showed that the contractor's system will not accept charges against fictitious accounts, our work also revealed that charges are routinely made against closed accounts and that accounts are routinely reopened without the knowledge of the responsible account manager.

In this connection, partly because the Chief Financial Officer's 1996 review covered the work authorization process, control of funds, and invoice review, our work did not cover those aspects at Fernald. However, while the Chief Financial Officer's report characterized some areas as strong, it also states that the team identified areas where controls should be strengthened and made several recommendations for changes at the site, such as strengthening certain controls over expenditures of funds to ensure that overexpenditures that have occurred in the past do not recur.

An additional concern raised by DOE was the cleanup schedule, which DOE thought should be brought up into the report summary. However, because we did not consider this a major objective, as we explain earlier in this report, we present this information in appendix IV.

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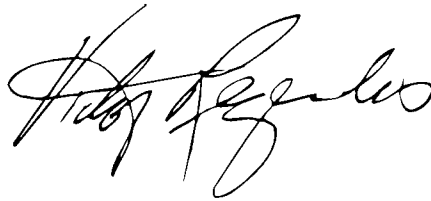
We conducted our review from March 1, 1996, through January 31, 1997, in accordance with generally accepted government auditing standards. Appendix V contains our detailed objectives, scope, and methodology.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this report. At that time, we will send copies of the report to the Secretary of Energy; the Director, Office of Management and Budget; and other interested parties. We will make copies available to others upon request.

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Please call me at (202) 512-3841 if you have any questions about this report.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Victor S. Rezendes". The signature is fluid and cursive, with the first name "Victor" and last name "Rezendes" clearly distinguishable.

Victor S. Rezendes  
Director, Energy,  
Resources, and Science Issues

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List of Requesters

The Honorable John Glenn  
United States Senate

The Honorable Mike DeWine  
United States Senate

The Honorable Rob Portman  
House of Representatives

The Honorable John Boehner  
House of Representatives



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## Abbreviations

AEDO	Assistant Emergency Duty Officer
ALARA	as low as reasonably achievable (goals and objectives)
NFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
EM	Office of Environmental Management
EPA	Environmental Protection Agency
ES&H	Office of Environment, Safety, and Health
FDF	Fluor Daniel Fernald
FEMP	Fernald Environmental Management Project
GAO	General Accounting Office
HQ	headquarters
ORPS	Occurrence Reporting and Processing System
UNH	uranyl nitrate hexahydrate
VITPP	vitrification pilot plant (project)





# Information on Allegations Concerning Management of Two Cleanup Projects at Fernald

The following discusses the purpose and status of the Department of Energy's (DOE) vitrification pilot plant (VITPP) and uranyl nitrate hexahydrate (UNH) projects and information relevant to the allegations published by the Cincinnati Enquirer about these projects.

DOE has divided the Fernald site into five segmented, or operable, units. Unit 1 is the waste pit area; unit 2 consists of other waste areas; unit 3 is the former production area; unit 4 consists of four silos and their contents; and unit 5 handles the remediation of the soils, groundwater, surface water and sediment, and flora and fauna. The VITPP project is located in operable unit 4; the UNH project was part of the cleanup of operable unit 3.

## DOE's Vitrification Pilot Plant Project

DOE's VITPP project at Fernald is a major step toward remediating 20 million pounds of low-level radioactive waste stored in three above-ground concrete silos since the 1950s.<sup>1</sup> Although the silos may pose relatively little risk of radioactive leaks now, DOE has recognized that the deteriorating silos cannot stand indefinitely and has taken several steps to mitigate potential risks from them. DOE's latest effort calls for DOE to treat the wastes now stored in the silos and ship the residuals off-site for long-term storage.

VITPP is an interim facility designed to confirm the feasibility of vitrifying the silos' contents outside of a laboratory setting. If tests at the plant are successful, DOE could use the test results from VITPP to design equipment and procedures for operating a full-scale vitrification plant at the site. DOE has established internal project milestones for the construction and testing of VITPP. It also has regulatory milestones established under a 1991 amended consent agreement between DOE and the Environmental Protection Agency (EPA) for the overall operable unit, such as implementing work plans for treating and burying the vitrified waste at an off-site location, that depend on the successful operation of the pilot plant.

## Status of VITPP

As of September 9, 1996, DOE had spent about \$41.4 million on the project. DOE has completed enough construction at the plant to begin vitrifying material formulated to simulate the radioactive wastes contained in the silos. DOE plans to complete these initial tests of simulated silo material by January 1997.

<sup>1</sup>Vitrification is a process for superheating waste material and chemical additives, using equipment called a melter, and converting the resulting material into glass. The resulting glass product can then be packaged into containers and buried at an approved waste disposal facility.

**Appendix I**  
**Information on Allegations Concerning**  
**Management of Two Cleanup Projects at**  
**Fernald**

DOE originally intended to follow up on the initial tests of simulated material by (1) completing additional construction at the plant necessary to safely process radioactive wastes stored in the silos and (2) conducting several months of equipment tests using the radioactive material. However, as discussed later, the project has experienced significant delays, equipment problems, and cost overruns. In light of these problems, DOE has decided to postpone the additional construction and testing of radioactive material at the plant and to convene a panel of experts to reexamine its strategy for cleaning up the area. DOE expects that by June 1997, the Department and its stakeholders will reach a consensus on the appropriate cleanup strategy for the area.

**Allegation: DOE Has Missed Construction and Operating Milestones for the Project. Testing Will Not Be Completed Until 17 Months Later Than Originally Planned.**

The Cincinnati Enquirer's November 27, 1995, article reasonably reported the project's status as of October 1995. As indicated in table 1, at that time, DOE (1) had missed its June and July 1995 internal milestones for completing construction and starting tests for the initial nonradioactive portion of the project, (2) was projecting 7-to 8-month delays in completing these steps, and (3) was estimating a 19-month overall delay in completing the nonradioactive and radioactive phases of testing at the project. The 17-month delay reported by the Cincinnati Enquirer differs from the 19 months estimated by DOE in October 1995 because the newspaper used an August 1995 DOE work plan for the cleanup of the silos to estimate completion of the project.

**Table I.1: Comparison of Starting and Completion Dates for Certain Activities at VITPP**

<b>Milestone</b>	<b>DOE's Feb. 1994 schedule</b>	<b>DOE's Oct. 1995 estimates</b>	<b>Slippage in 1995 estimate's milestone</b>	<b>Nov. 1996 actual or latest estimate</b>
Complete initial construction	June 95	Jan. 1996	7 months	May 1996 (actual)
Start initial testing	July 1995	Mar. 1996	8 months	June 1996 (actual)
Complete testing of radioactive material	Mar. 1996	Oct. 1997	19 months	Oct. 1997 (est.)

Table I.1 also illustrates that DOE is continuing to experience delays with VITPP. Specifically, DOE was not able to meet the milestones established in

November 1995 for completing the first phase of construction or for starting initial testing at the facility. For example, the Department completed construction 4 months later than planned and started testing 3 months later than anticipated.

DOE officials agree that their latest estimate for completing testing at VITPP needs to be revised to reflect these most recent delays. However, the officials do not intend to revise the estimate until DOE, its stakeholders, and regulators review the results of initial testing and agree on the future of the project.

Allegation: The Project's Estimated Total Cost Has Jumped From \$14 Million to \$56 Million.

DOE's estimate of VITPP's total cost has increased significantly since the Department first estimated these costs. During February 1994, DOE approved an original cost estimate of \$14.1 million and established this as an initial baseline against which to measure the project's future costs. Since then, DOE or Fluor Daniel Fernald has approved more than 20 changes to its baseline cost estimate to account for technical problems with the project, weather-related delays, and other factors. In its July 1996 baseline for a 10-year cleanup of the site, DOE increased the estimated budget to build, operate, decontaminate, and decommission VITPP to \$56 million.

The \$56 million estimate is a more accurate estimate than the original \$14.1 million because the original estimate did not include operating or decontamination and decommissioning costs for the plant. However, the \$56 million estimate understates the project's total costs because it does not include (1) VITPP's share of such sitewide services as providing drinking water, heat, and other utilities and of general administrative costs or (2) estimates of the total cost needed to complete the project. As of September 9, 1996, DOE's estimate of costs to complete the project, excluding general services and administrative costs, was \$66 million.

Allegation: DOE's December 1995 Study of VITPP's Problems Identified Over 100 Safety, Maintenance, and Reliability and Availability Concerns. DOE and Fluor Daniel Fernald Did Not Have a Firm Date for Correcting These Problems.

DOE's December 1995 study of VITPP problems and a companion analysis of the plant's potential reliability, availability, and maintenance (the RAM

study) reported 70 items of potential concern.<sup>2</sup> The items generally related to

- safety issues, such as the need to conduct a more extensive analysis of methods to shield workers from the radiation associated with later testing at the plant, posting signs to alert workers of possible dangers, and precautions needed for safely working near the high-temperature melter;
- maintenance concerns, such as the limited space throughout the plant to access equipment and perform anticipated maintenance and the need to develop worker-friendly procedures for cleaning pipelines that may plug or equipment that might have to be replaced; and
- suggestions to improve the management process for turning the completed VITPP project over to operating personnel and questions about the reliability of some of the plant's major systems, such as the system to remove waste gases from the plant.

The Cincinnati Enquirer's allegation that when the article was published, DOE and Fluor Daniel Fernald did not have a firm date for addressing the concerns is essentially correct. The contractor's January 1996 response to the concerns raised by the RAM study indicated that about 40 percent of the items had already been addressed or were being corrected and about 30 percent would be fixed. For the remaining 30 percent, the contractor disagreed that problems existed. Neither DOE nor the contractor identified specific dates for completing work on any of the concerns or for resolving differences of opinion.

Since that time, DOE still has not established completion or resolution dates. DOE officials reviewed Fluor Daniel Fernald's January 1996 response to the RAM study and twice asked the contractor to respond to additional questions. DOE's requests generally asked for additional technical detail to explain Fluor Daniel Fernald's initial information or to clarify partial responses. DOE officials have also worked closely with Fluor Daniel Fernald managers to correct problems that delayed the plant's opening. Some of the problems that Fluor Daniel Fernald corrected, such as covering areas of the plant exposed to freezing rain or snow to improve the safety of workers, were mentioned in the RAM study. DOE officials believe that all issues raised by the study have been addressed. However, DOE did not establish a mechanism for formally tracking the status of all safety and maintenance issues raised by the studies.

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<sup>2</sup>Sue Peterman, Draft Final Operable Unit 4 Investigation Report (Dec. 20, 1995) and companion report of the RAM analysis performed on VITPP by G.E. Bingham of Intech, Inc. (Dec. 11, 1995). Ms. Peterman was the Operable Unit 4 Investigative Team Leader.

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Allegation: Fluor Daniel Fernald Has Not Fixed Life-Threatening Structural Defects That Existed at the Plant.

The Cincinnati Enquirer's March 3, 1996, article alleged that Fluor Daniel Fernald had not fixed (1) concrete walls that were pockmarked or incorrectly poured, (2) welds on a major tank that were improperly done, (3) steel reinforcement rods that extended outside concrete walls, and (4) other problems. The newspaper supported some of these allegations with photographs of alleged defects; other alleged defects that involved questions concerning the quality of construction did not lend themselves to photographs or direct observation.

In March 1996, DOE reviewed the allegations and Fluor Daniel Fernald's efforts to identify and correct construction problems at the plant. Although DOE officials found no support for the allegations, they found that in some cases, representatives of the design contractor had not consistently documented their approval of design changes needed to correct construction problems. DOE officials later satisfied themselves that the alleged structural defects had been corrected or did not pose a hazard and that the documentation problems did not jeopardize the overall integrity of the contractor's construction activities.<sup>3</sup>

During two tours of the pilot plant during March and April 1996, we observed the results of Fluor Daniel Fernald's efforts to correct several of the alleged construction problems at the plant. For example, we observed that Fluor Daniel Fernald had coated many of VITPP's walls with an epoxy-like material from the floor to about 3 feet from the floor. DOE's facility representative conducting one of the tours indicated that the coating would minimize seepage of any radioactive material that might possibly leak from equipment during vitrification. A December 13, 1994, engineering evaluation of the plant's poured-concrete walls commissioned by Fluor Daniel Fernald concluded that although some walls were pockmarked, they met design specifications.

In addition, we observed that extra concrete had been cut away from an improperly poured wall to make a straight vertical surface. The remaining concrete did not appear to be damaged. Also, we observed that the tank discussed by the Cincinnati Enquirer, which had been damaged during delivery and installation, was in place and ready for testing. According to DOE's December 1995 study of VITPP, after an independent inspection team

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<sup>3</sup>DOE officials addressed specific allegations concerning potentially inadequate reinforcing bars, deficient welds in tanks and piping, the pockmarking of concrete walls, and the improper pouring of concrete walls.

questioned the integrity of the welds used to fix the tank, Fluor Daniel Fernald satisfactorily repaired the tank.

During our tours, we did not observe steel reinforcement rods jutting outside of concrete walls similar to those in the photographs published by the Cincinnati Enquirer. Although the steel rods may have protruded from the walls during the plant's construction, they were no longer visible.

Overall, the alleged construction problems at VITPP do not appear to have seriously compromised safety. Between June 1996, when DOE started operating the plant, and September 1996, DOE had not reported any occurrence of health or safety problems from the construction or operation of VITPP. However, on December 26, 1996, a small fire developed at the plant after heated glass from the melter leaked onto the epoxy-covered floor. No one was injured in the fire, and DOE is investigating the causes of the leak and fire.

Allegation: DOE's December 1995 Study Reported That (1) the Fast-Tracking of the Building of a Full-Scale Plant Was a Major Concern to the Study's Investigators and (2) DOE and Fluor Daniel Fernald Should Evaluate the Costs and Benefits of Alternatives to Vitrification.

DOE's December 1995 evaluation of VITPP discussed both concerns. In regard to fast-tracking<sup>4</sup> the remaining work, the study team observed that the strategy was valid but cautioned that managing a fast-track project is difficult. As for evaluating alternatives, the study team noted that numerous approaches to cleaning up the operable unit existed and recommended that DOE and Fluor Daniel Fernald review the cost and benefits of key alternatives.

DOE has responded positively to these concerns. Within a few weeks of completing the December 1995 study, a DOE-sponsored value engineering team met to study alternatives to building a full-scale vitrification plant at the site. The resulting study, issued in January 1996, proposed (1) upgrading VITPP and building another pilot-plant-size vitrification facility to operate in tandem with the upgraded plant, (2) using other solidification and stabilization technologies on the less radioactive wastes now stored in one of the silos, and (3) using other technologies to clean up

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<sup>4</sup>We use the term fast-tracking to mean that DOE and the contractor initially put the project on an accelerated schedule. For example, DOE officials accelerated the VITPP project by deciding to begin some phases of facility and equipment design before completing preliminary design work.

the more radioactive wastes stored in the remaining two silos.<sup>5</sup> DOE has notified its regulatory agencies that it is evaluating the second option, which the study estimated could save \$68 million, and plans to evaluate the remaining options in time for the spring 1997 evaluation of the plant's future. DOE site officials have also stopped the design, procurement, and construction of the full-scale plant until after the spring 1997 evaluation.

Allegation: Various Problems Contributed to VTPP's Schedule Delays and Cost Overruns.

DOE and Fluor Daniel Fernald officials acknowledge that many of the problems discussed by the Cincinnati Enquirer contributed to poor performance at VTPP. These problems included fast-tracking, the project's underestimated complexity, concurrent design and construction of the project, and the contractor's overly optimistic assessment of its ability to recover from schedule delays.

DOE and Fluor Daniel Fernald fast-tracked VTPP in order to meet regulatory milestones under DOE's amended consent agreement with the EPA for the overall operable unit, despite the technical risks of the project. In 1993, when Fluor Daniel Fernald issued its first request for proposals for a vitrification melter, DOE had completed only laboratory-scale tests of the feasibility of vitrifying the silos' wastes. Nevertheless, DOE decided to overlap phases of the plant's design, construction, and operation in order to meet these milestones for the overall operable unit.

Fluor Daniel Fernald also initially underestimated the complexity of building a larger-than-laboratory-scale, high-temperature vitrification facility. The contractor's early cost estimates for the project assumed that the plant's melter, which is a key component of the facility, could operate at 100-percent efficiency. Subsequent baselines have assumed less optimistic 50-percent and 33-percent efficiencies. In addition, procurement, design, and delivery of the melter took 9 months longer than expected. Because Fluor Daniel Fernald subcontractors needed information about the melter to complete the design and construction of other parts of the plant, the delays in selecting a vendor for the melter and designing the melter delayed completion of the plant's design and mechanical and electrical work.

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<sup>5</sup>The value engineering team also proposed that DOE study using rail lines more extensively to ship material to the Nevada Test Site for long-term disposal.

Fluor Daniel Fernald continued the design and construction of the plant and plant systems concurrent with a subcontractor's design and fabrication of the melter. Fluor Daniel Fernald used preliminary information about the melter to design and build interfacing equipment systems and water and electricity hook-ups in the plant. After the vendor delivered melter components that were different from the preliminary designs, Fluor Daniel Fernald had to rework parts of VITPP to connect utilities and equipment systems with the melter. For example, from May 1995, when Fluor Daniel Fernald began receiving melter components, through May 1996, the contractor issued about 225 design change notices to (1) correct problems caused by the concurrent design of the melter and VITPP, (2) improve the plant's overall safety, or (3) redesign pumps and other equipment that had been installed at the plant but that did not pass initial tests. According to DOE's December 1995 study of VITPP's problems, the number of design changes is indicative of problems within a project.

The contractor was also overly optimistic in assessing its ability to recover from schedule delays. Fluor Daniel Fernald officials provided monthly information for the contractor's cost performance reports and DOE's progress-tracking system that highlighted (1) delays in obtaining design information from equipment vendors, (2) frequent design changes needed because of limited data, and (3) delays in starting mechanical and electrical work at the plant. However, the contractor repeatedly assured DOE that it could overcome these delays and meet the regulatory milestones. It was not until August 1995, after the contractor had missed the project's original milestone for completing construction, that Fluor Daniel Fernald admitted that problems at VITPP could delay the design and construction of the full-scale vitrification plant.

Allegation: DOE Managers at Fernald Exercised Limited Oversight Over the Project and Allowed Problems at the Plant to Fester Too Long.

DOE's Associate Director and Deputy Associate Director for Environmental Restoration at Fernald acknowledge that if DOE managers had exercised more oversight of Fluor Daniel Fernald's early decisions on the project, DOE could have avoided some of VITPP's major problems. At the project's beginning, site managers at the associate director level and above and at DOE headquarters involved themselves by approving the plant's original baseline schedule. DOE's primary project manager was also generally aware of early delays and overruns with the project. However, neither level of site managers exercised sufficient oversight of the project to correct problems before they became significant. For example, DOE senior



site managers focused their attention during this early phase of the project on whether Fluor Daniel Fernald was meeting regulatory milestones for the overall operable unit. Although some DOE senior managers were aware of early procurement and design delays, they generally did not question the impact of these problems on the schedule or the appropriateness of Fluor Daniel Fernald's corrective actions. This was largely because (1) no regulatory milestones were associated with construction of VITPP and (2) Fluor Daniel Fernald insisted that the problems would not affect its ability to meet the regulatory milestones of the overall operable unit.

DOE also did not assign early in the project a sufficient number of staff with the technical capability to challenge Fluor Daniel Fernald's early assertions that the project would recover from its delays. During 1993, 1994, and the first half of 1995, DOE assigned primarily one staff to the project assisted by a facility representative who monitored field activities. They were to (1) prepare regulatory documents for the overall operable unit, (2) monitor the design and construction of the pilot plant, review monthly invoices of project costs, and (4) prepare budget requests and respond to funding changes that affected the entire operable unit. In balancing this workload, DOE staff did not have the time nor the technical expertise to counter Fluor Daniel Fernald's assertions that it could recover from the project's initial delays and meet the plant's cost and schedule goals. DOE did not have a firm basis for revising the plant's cost and time estimates until August 1995, when Fluor Daniel Fernald admitted schedule delays.

Allegation: DOE Did Not Penalize Fluor Daniel Fernald for Poor Performance at VITPP Until November 1995. At That Time, DOE Penalized the Company \$675,000 for Missing VITPP's Milestones.

DOE has a cost-reimbursable performance-based fee contract with Fluor Daniel Fernald, which reimburses the contractor for its monthly costs and provides for additional semiannual fees on the basis of the contractor's performance.<sup>6</sup> Specific to VITPP, the contractor can earn award fees for the project if it meets milestones that have been agreed to by DOE and the contractor and are included in semiannual performance evaluation plans. The contractor can also earn award fees if DOE subjectively determines that the contractor's overall performance for the entire site, including

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<sup>6</sup>The first year of the contract (fiscal year 1993) was an exception because the contract provided a fixed fee for performance.

VITPP, is satisfactory.<sup>7</sup> Depending on its performance on VITPP, the contractor may earn all of the milestone and subjective award fees or some portion thereof. For example, the contractor can earn less than the maximum award fee possible during every 6 months if (1) it misses one or more VITPP milestones and/or (2) performance on the project is sufficiently poor enough for DOE to deduct fees from its overall subjective evaluation.

DOE has twice paid Fluor Daniel Fernald award fees for meeting early VITPP milestones included in DOE's semiannual performance evaluation plans. In fiscal year 1994, the contractor completed a VITPP safety analysis report on time and earned the full \$135,000 in an agreed-upon award fee for the milestone. Similarly, in the first half of fiscal year 1995, the contractor met the agreed-upon milestone for completing construction of a prefabricated VITPP auxiliary building and earned the full \$270,000 associated with the milestone.

The second half of fiscal year 1995, ending October 31, 1995, was the first period in which the contractor did not earn the full amount of potential award fee. The contractor could have earned \$675,000 for meeting VITPP's start-up milestones. However, DOE determined that because of the missed milestones and general deficiencies in managing the project and controlling schedules, the contractor would not receive any of the fee. Furthermore, Fluor Daniel Fernald could have earned an additional \$1.62 million in award fees for satisfactory performance at the entire site. DOE determined that because of project delays at VITPP, the contractor should receive \$1.2 million—\$405,000 less than the contractor could have earned.

During fiscal year 1996, DOE determined that the contractor would not receive \$2.16 million in potential award fees for missing VITPP milestones and for experiencing excessive cost and schedule overruns on the project.

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## DOE's Uranyl Nitrate Hexahydrate Project

When production ended at Fernald in 1989, about 200,000 gallons of UNH (uranium ore dissolved in nitric acid) remained in 18 stainless steel tanks in various locations at the Fernald complex. The tanks and their contents were a concern because (1) UNH was a mixed hazardous waste; (2) the tanks, valves, and other equipment used to store the solution were approximately 40 years old and were subject to periodic leaking; and (3) DOE's surveillance of the tanks cost about \$100,000 per year.

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<sup>7</sup>The contractor also earns a basic fee that is prorated and paid monthly for overall satisfactory performance on activities throughout the site. Although up to 25 percent of this fee can be tied to performance, the contractor has received the basic fee since the fee was initiated.

Consequently, in 1991, DOE approved a contractor-proposed project for the removal of the UNH solution. The UNH project consisted of several steps, including (1) precipitating the uranium from the solution by the addition of certain chemicals, (2) filtering the residual material from the solution, (3) loading the residual material into drums, and (4) shipping the drums off-site. According to the DOE UNH project manager, the nonhazardous solution remaining from the project was discharged from the site in accordance with a discharge permit issued under the Clean Water Act.

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## Status of UNH Project

DOE, Fluor Daniel Fernald, and the Ohio EPA consider the UNH project a completed success. Filtration of the residual material from the last UNH batch was completed on August 30, 1995. The Ohio EPA had mandated that the UNH solution be removed from the storage tanks by September 25, 1995.<sup>8</sup> The shipment of the drummed UNH residual material to the Nevada Test Site began in April and was completed in September 1996.

However, the project has taken about \$16.8 million and about 5 years to complete.<sup>9</sup> When the project was initially proposed in fiscal year 1991, Westinghouse—the Fernald on-site contractor at the time—estimated that by using existing equipment and former operating procedures with minor modifications, it would take \$750,000 and about 7 months to remove the UNH solution from the tanks and put the residual material in drums. An April 1993 spill of UNH solution led to a determination that a more structured approach and new systems were needed to move forward.

### Allegation: Fluor Daniel Fernald Used Defective Leakproof Pumps to Transfer UNH Solution Between Tanks During the Project.

Fluor Daniel Fernald did not use defective leakproof pumps to transfer UNH solution during the project. However, Fluor Daniel Fernald did install initial and then substitute styles of transfer pumps that were defective and leaked filtrate water during hydrostatic testing.<sup>10</sup> Fluor Daniel Fernald's failure to inspect and/or review the two styles of pumps beforehand contributed to the installation of the leaking pumps and the associated

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<sup>8</sup>By order dated December 27, 1994, the Ohio EPA mandated that DOE and/or Fluor Daniel Fernald take certain actions regarding the UNH project. Among those actions were that UNH removal begin no later than January 17, 1995, and be completed no later than September 25, 1995.

<sup>9</sup>The \$16.8 million represents funds spent from fiscal year 1993 through February 1996. DOE estimated that the Department spent an additional \$400,000 from fiscal year 1990 through fiscal year 1992 for repackaging, surveillance, and maintenance of UNH and other nuclear materials at the site.

<sup>10</sup>Filtrate water is wastewater that has been prepared for discharge by chemically treating and filtering to remove uranium and heavy metals.

delay to the UNH project. Specifically, DOE records show that Fluor Daniel Fernald waived its right to witness a factory performance test on the initial style of pumps used on the project.<sup>11</sup> Fluor Daniel Fernald gave the waiver, in part, because the pumps would also be examined on-site. When the pumps arrived in September 1994, Fluor Daniel Fernald installed the pumps but found that they leaked because of cracked casings. The pumps were removed and sent back to the manufacturer for replacement or repair.

DOE records further show that Fluor Daniel Fernald then installed substitute pumps without conducting an engineering review of the pumps. According to Fluor Daniel Fernald memoranda, the substitute pumps were installed because they were already available on-site and their installation would keep the UNH project on schedule. However, the substitute pumps also leaked during testing; had vibration problems; were found to be incompatible with system supports, piping, and control instrumentation; and also had to be removed. Ultimately, Fluor Daniel Fernald and DOE made the decision in January 1995 to reinstall the initial pumps, after repair, and found that they worked properly.

Allegation: UNH Leaked From the System Because of Defective Equipment.

During 1993 through 1995, Fluor Daniel Fernald reported eight UNH project leaks to DOE through the Department's occurrence-reporting system.<sup>12</sup> Two of those reported leaks, involving filtrate water, can be attributed either directly or indirectly to defective equipment.

In one case, in December 1994, about 500 gallons of filtrate water leaked from the system in large part because of a defective weld in system piping. A Fluor Daniel Fernald analysis of the defective weld revealed that the weld had cracked because of improper weld installation. The weld lacked adequate penetration as well as adequate thickness. Subsequently, Fluor Daniel Fernald also identified and corrected three other defective welds.

In a second case, also in December 1994, about 10 to 15 gallons of filtrate water leaked from the system while one of the transfer pumps was being

<sup>11</sup>According to DOE and Fluor Daniel Fernald officials, the contract between Fluor Daniel Fernald and the pump manufacturer contained a stipulation allowing Fluor Daniel Fernald the right to witness a performance test on the transfer pumps at the manufacturer's plant prior to the pumps' shipment to Fernald.

<sup>12</sup>DOE's occurrence-reporting system is a system for reporting operations information related to DOE owned or operated facilities and processing that information to identify the root causes of unusual, emergency, and other types of actions.

tested. Defective pipe line valves had previously been detected and removed so that the valves could be repaired.<sup>13</sup> According to a DOE daily report on the UNH project, however, Fluor Daniel Fernald directed its construction contractor to reinstall the defective valves so that scheduled pump testing could continue. When pump testing continued, one of the defective valves had still not been reinstalled and the line had not been closed off. With the pump running, filtrate water poured out of the line where the defective valve had been removed and onto the plant floor.

Allegation: Fluor Daniel Fernald Eliminated and/or Reduced the Inspection Requirements of Equipment Being Built for the UNH Project.

Three cases were identified in which Fluor Daniel Fernald eliminated and/or reduced the inspection requirements associated with the UNH project. In each case, the elimination and/or reduction of the inspection requirements led to further UNH project problems.

For example, in one case previously discussed, Fluor Daniel Fernald waived its right to witness a factory performance test on the transfer pumps prior to their shipment to Fernald. In a second case, Fluor Daniel Fernald eliminated the requirement to perform a dye penetrant test on in-process welds.<sup>14</sup> The dye penetrant test is designed to ensure that the welds are being done properly. According to a Fluor Daniel Fernald quality assurance inspector on the UNH project, Fluor Daniel Fernald eliminated the dye penetrant test so that the UNH project could stay on schedule. DOE's special project team report on the Fernald allegations indicated that this test may have detected the defective weld that caused the leakage of about 500 gallons of filtrate water in December 1994.

In a third case, Fluor Daniel Fernald elected not to test the acceptability of UNH construction that had been completed by one of its subcontractors. According to DOE's UNH project manager, DOE expected the contractor to perform the testing. Subsequently, numerous problems were identified. Those problems included the following: a portion of the piping was built without secondary containment; there were cracked and substandard welds; pumps leaked upon installation; and defective valves (valves that either leaked or could not be easily opened and closed) had been installed. According to the DOE UNH project manager, Fluor Daniel Fernald elected to forego the acceptance testing so that further UNH project testing could

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<sup>13</sup>The valves were determined to be defective because the valves either leaked or could not be easily opened and closed, and the handles failed with limited operation.

<sup>14</sup>Fluor Daniel Fernald's procedures also called for the visual inspection of all welds.

begin on schedule. After it was determined that removal of UNH would not begin on January 17, 1995, as mandated by the Ohio EPA, the DOE UNH project manager said that DOE required Fluor Daniel Fernald to conduct the construction acceptance testing before proceeding any further. This official added that DOE also realized it needed to pay closer attention to Fluor Daniel Fernald's activities.

Allegation: While the UNH Cleanup Was Completed in August 1995, It Initially Was Delayed and Then Riddled With Design, Equipment, and Radiation Contamination Problems.

A February 1995 Fluor Daniel Fernald report on the UNH project confirmed much of this allegation. According to that report, there were discrepancies between key UNH documents regarding the project's design and description; certain piping systems had been installed in an improper manner; and a UNH project leak had occurred because of a defective weld.

Site officials also acknowledged that during 1991-94, there were certain delays and a myriad of problems associated with this project, which DOE initially estimated would be completed in November 1991. For instance, according to Fluor Daniel Fernald's deputy project manager on the UNH project, initially there was poor process control, inadequate documentation, and poor labeling of the existing tank and system components. This Fluor Daniel Fernald official added, however, that Fluor Daniel Fernald made tremendous strides in correcting these problems during 1995.

Our review confirmed that Fluor Daniel Fernald made progress on the UNH project in 1995, particularly after Fluor Daniel Fernald made certain personnel changes. Those changes consisted of adding additional and better qualified personnel to the project.

Allegation: Fluor Daniel Fernald Repeatedly Made False Performance Claims to DOE Regarding the Project by Stating That It Had Successfully Completed Various Studies and Equipment Testing. In Turn, DOE Failed to Review Fluor Daniel's Fernald Performance Claims.

No incidents were identified where Fluor Daniel Fernald made false performance claims to DOE. On the contrary, Fluor Daniel Fernald's status reports on the UNH project seem to accurately present the progress or lack of progress being made on the project. In addition, DOE's records indicate

that the Department was well aware of the many problems associated with the project.

Allegation: Fluor Daniel Fernald Was Not Financially Penalized for Its Poor Performance or the Deceptive Performance Reports.

Although Fluor Daniel Fernald was not financially penalized during the UNH project, it did not receive \$540,000 in award fees that it could have earned, had its performance been better.

In a somewhat related matter, DOE/Fernald officials have submitted 18 UNH-related requests to the site's Avoidable Cost Committee that would compel Fluor Daniel Fernald to return certain funds to DOE under the Department's avoidable cost rule.<sup>15</sup> Under this rule, as provided in the contract between DOE and Fluor Daniel Fernald, the contractor is responsible for any direct costs that were avoidable and were incurred by Fluor Daniel Fernald, without any fault of DOE, exclusively as a result of negligence or willful misconduct on the part of contractor or subcontractor personnel in performing work under the contract.

Included in the 18 requests were requests related to (1) the removal and reinstallation of the UNH transfer pumps; (2) the leakage of filtrate water because of a defective weld; and (3) the leakage of filtrate water because of a missing pipe line valve (see our earlier assessment of these incidents). As of November 1, 1996, the first two requests had not been closed. DOE was performing an independent evaluation of the requests to determine the incidents' impact on the UNH project's cost and schedule. Regarding the third request involving the leakage of filtrate water because of a missing pipe line valve, DOE closed the case because the incident had no significant impact on the project.

Allegation: The Identities and Medical Conditions of Three Workers Who Were Splashed and Contaminated With UNH Were Not Disclosed.

In April 1995, three workers were splashed as a result of a UNH spill. DOE redacted the names of the individuals involved in the spill from information provided to the press because of Privacy Act considerations. According to DOE's Director of Public Affairs, representatives of the press were not provided with medical information on the workers because they did not request the information. During our review, we interviewed two of the three workers involved and were told that neither they nor the other

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<sup>15</sup>Fernald's Avoidable Cost Committee is chaired by the site's chief contracting officer.

worker was harmed by the spill. According to our DOE audit liaison, the third worker involved in the spill had quit his employment at Fernald and was not available for interview.

## Other Observations Regarding the UNH Project

During our review, we identified other project management problems that affected the UNH project. Specifically, contrary to DOE's requirements, many project management documents key to the success of the UNH project were not prepared until late in the life of the project or not prepared at all. The unavailability of these documents in the early stages of the project contributed to the project's cost growth and schedule delay. In addition, UNH lessons learned were not always shared with other Fernald projects. As a result, certain pipe line valves known to be defective on the UNH project were subsequently installed on the Vitrification Pilot Plant. According to a September 30, 1996, memorandum from Fluor Daniel Fernald to DOE, some of those valves were being replaced.

## Timeliness of the UNH Project's Documentation

DOE's project management order considers the preparation of certain documentation to be key to the success of any project. This documentation explains, among other things, what is going to be done, how it shall be accomplished, and who will be responsible for carrying out the project. According to information obtained from site officials, certain key documents were not prepared until late in the life of the project or not prepared at all. One such document is the Technical Information Plan. The plan identifies all DOE and other requirements that Fluor Daniel Fernald had to comply with in the removal of the UNH and that should have been prepared at the fiscal year 1990 outset of the project. However, it was not prepared until November 1994. According to a Fluor Daniel Fernald evaluation report on the UNH project, the technical information plan was prepared late because the UNH project was perceived to be a simple project. The Fluor Daniel Fernald evaluation report added that because of the delay in publishing this plan, significant UNH work was not done according to DOE's requirements, delays occurred in accomplishing work because of unclear lines of responsibility, and a full understanding of the project's obligations was lacking.

Other documents also prepared late include a quality assurance plan and a critical path schedule. A project management plan was not prepared at all. The quality assurance plan, which was prepared in January 1995, describes the processes that will be used to detect, control, correct, and prevent UNH project problems. The critical path schedule, which was prepared in



February 1995, shows the interrelationships with all phases of the project including transfer pump redesign and construction, weld inspection and repair, operator training, and the removal of UNH. The project management plan, which was not prepared, is supposed to contain, among other things, a master milestone schedule, project budget, and a listing of key project personnel by name and oversight responsibility.<sup>16</sup>

Site officials offered us various reasons why the preceding documents were prepared late or not at all. According to a Fluor Daniel Fernald official involved in doing an evaluation of the UNH project, Fluor Daniel Fernald personnel at the outset of the project did not know what documents were required by DOE. According to the DOE project manager on the UNH project, from March 1993 to July 1994, Fluor Daniel Fernald viewed the UNH project as an extension of Fernald's production operations. The manager added that Fluor Daniel Fernald believed that if the procedures in place were good enough for production, then the procedures were also good enough for the removal of UNH. The manager further said that DOE did not insist on the preparation of certain key documents because it was believed that the emergency nature of the UNH removal took precedence over other matters, such as the preparation of documents.

## Lessons Learned Not Shared With Other Projects

DOE's project management order also emphasizes the importance of sharing lessons learned. This order stresses that when problems occur on a project, those problems should be reported so that similar problems do not occur on other DOE projects. We found one instance in which UNH lessons-learned information about defective pipe line valves was not shared with another Fernald project.

During the testing on the UNH project in December 1994, several problems were encountered with the performance of certain pipe line valves. Specifically, the valves were found to leak and were difficult to open and close, and the handles failed with limited operation. After further evaluation of the valves, Fluor Daniel Fernald abandoned their use on the UNH project in January 1995 and replaced them with another style of valve. Subsequently, the same type of defective valves was installed and experienced problems on VITPP. According to a September 30, 1996, memorandum from the Fluor Daniel Fernald Vice President for Waste Management Technology and Silo Projects to DOE, some of these defective

<sup>16</sup>DOE site officials indicated that other documents were prepared in lieu of a project management plan, which is required by DOE Order 4700.1. We found that these other documents did not include all the essential ingredients of a project management plan.

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**Appendix I**  
**Information on Allegations Concerning**  
**Management of Two Cleanup Projects at**  
**Fernald**

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valves on the VITPP were being replaced. This official said that the valves in question were determined to have a design deficiency and should not be used in systems transferring radioactive and/or hazardous materials. This official added that no root cause analysis was done on the defective valves that would have alerted site officials against the valves' further use. This Fluor Daniel Fernald official subsequently told us that such an analysis was not done because the defective valves on the UNH project were not placed into operation.

# Information on DOE's Oversight and Safety and Health Activities and Allegations of Safety and Health Problems at Fernald

The following discusses DOE's processes for ensuring that Fluor Daniel Fernald adheres to safety and health requirements and information relevant to the allegations published by the Cincinnati Enquirer about safety and health conditions at the site.

## Background

The operations at DOE's Fernald site pose a variety of potential hazards to workers and the public located nearby. Although the production of uranium metal has ended, a large amount of nuclear materials and chemicals is stored at the site. Radioactive hazards include contaminated facilities and nearly 16 million pounds of stored uranium, while chemical hazards include acids and process waste. Furthermore, ongoing decontamination and decommissioning activities pose a variety of hazards to workers. Site activities include the decontamination and dismantlement of production facilities, construction activities related to environmental cleanup, and waste management.

DOE requires Fluor Daniel Fernald to comply with numerous safety and health standards aimed at minimizing the risks posed by site operations. Such standards include DOE orders and regulations pertaining to a range of functional areas, such as the protection of workers and the public from radiation, nuclear criticality safety, maintenance, quality assurance, operations, fire protection, and occupational safety and health. The Fernald Area Office's Office of Safety and Assessment is primarily responsible for performing the area office's oversight of the contractor to ensure compliance with these requirements. The Area Office's safety management performance has been subject, in turn, to oversight by the Defense Nuclear Facilities Safety Board (DNFSB) and by DOE's headquarters offices of Environmental Management (EM) and Environment, Safety, and Health (ES&H).

## DOE's Safety Oversight at Fernald Was Weak but Has Improved

From 1993 through 1995, the officials representing DNFSB, EM, and ES&H raised serious concerns regarding the Fernald Area Office's capability to ensure the contractor's compliance with DOE's safety and health requirements. The actions taken by the Fernald Area Office in response to these concerns have improved its ability to oversee the contractor's safety and health performance. The Fernald Area Office's level of oversight in fiscal year 1996 was significantly higher than the level of oversight it exercised in previous years.

In reviewing the site's operations, DNFSB found that the Fernald Area Office had inadequate plans and preparations to supervise the contractor's activities, did not have adequate technical staff to ensure that safety requirements were adhered to, and did not stay on top of the daily activities of the contractor. In their Recommendation 93-4, issued in June 1993, DNFSB recommended, among other things, that DOE develop and implement a technical management plan for Fernald. This plan would define the responsibilities and necessary qualifications of the DOE staff at the site and outline a detailed program for ensuring Fernald's compliance with applicable standards related to public and worker safety. DNFSB also recommended that DOE "immediately establish a group of technically qualified Facility Representatives at Fernald to monitor the ongoing activities of daily operations at the site." In response, the Fernald Area Office developed a Technical Management Plan for the site, established a Facility Representative Program, and initiated a qualification program for the facility representatives.

However, in July 1994, EM reviewed the Fernald Area Office's program for assessing operations at the site and found it to be unsatisfactory. Specifically, EM found that the Fernald Area Office was not conducting required assessments, did not systematically follow up on prior assessments, did not transmit the assessment reports to the contractor, and was not considering assessment results in the award fee process. In response, the Fernald Area Office developed a plan for its Conduct of Operations assessment program, developed and implemented a schedule of assessments, started reporting the assessment results to the contractor and following up to ensure that the contractor corrected identified problems, and started considering the assessment results in award fee decisions.

In spite of this progress, in February 1995, site residents from DOE's ES&H Office reported that the Fernald Area Office's oversight program lacked "the structure and resources necessary to validate the adequacy of the contractor's operational safety and health programs." Specifically, they reported that the Fernald Area Office did not have a formalized system in place to track and show trends in the status of safety and health deficiencies it had identified, that the Fernald Area Office's line managers did not conduct routine walk-throughs of Fernald facilities, and that the Fernald Area Office had not developed procedures for implementing its safety and health responsibilities. To address these problems, the Fernald Area Office started to develop a computerized tracking and trending system, set up a program requiring the Fernald Area Office's personnel to

**Appendix II**  
**Information on DOE's Oversight and Safety**  
**and Health Activities and Allegations of**  
**Safety and Health Problems at Fernald**

conduct formal documented walk-throughs of Fernald facilities, and issued procedures regarding its safety and health oversight programs.

It was not until May 1995, when EM performed a follow-on review, that the area office's program for assessing operations was found to be satisfactory.

To determine the extent to which the Fernald Area Office's oversight activity has changed over time, we obtained data on the number of reviews of the contractor's safety and health performance that the Fernald Area Office formally transmitted to the contractor from fiscal year 1993 through fiscal year 1996. (See table II.1.) The contractor is expected to take appropriate action on all review results that the Fernald Area Office formally submits to the contractor. These reviews can be formal assessments of the contractor's operations or less rigorous surveillances.<sup>1</sup> We found that the Fernald Area Office transmitted few assessments and surveillances to the contractor in 1993 and 1994 but significantly increased the number transmitted by fiscal year 1996. These covered such topics as the conduct of operations, compliance with the Occupational Safety and Health Administration's construction asbestos regulation, radiological control practices, implementation of DOE's nuclear safety regulations, and quality assurance.

**Table II.1: Fernald Area Office Assessments and Surveillances Formally Transmitted to Fluor Daniel Fernald, Fiscal Years 1993-96**

<b>Fiscal year</b>	<b>Assessments</b>	<b>Surveillances</b>
1993	1	0
1994	4	3
1995	8	1
1996	15	14

Note: Most of these assessments and surveillances were performed by the Fernald Area Office; the remainder were performed by Modern Technologies Corporation, a support contractor for the Fernald Area Office.

According to the Fernald Area Office's Associate Director for Safety and Assessment, the low level of oversight activity in 1993 and 1994 is attributable in part to confusion during that period over the level of

<sup>1</sup>Assessments are formal reviews aimed at determining and documenting whether items, processes, or services meet specified requirements. Surveillances are acts of monitoring or observing to verify whether an item or activity conforms to specified requirements. Assessments have a higher level of rigor, are more well defined, and are more comprehensive than surveillances, which generally only look at one project or building. In addition to assessments and surveillances, Fernald Area Office staff also produce field observations on the basis of walk-throughs of facilities. The Fernald Area Office provides the contractor with copies of these observations but does not expect action to be taken on them.

oversight that DOE should exercise over an environmental restoration management contractor. Furthermore, since the Oak Ridge Field Office had the primary responsibility for oversight at Fernald prior to 1993, the Fernald Area Office needed time to develop programs and procedures for oversight. Finally, the Fernald Area Office lost a number of its technical staff to the Ohio Field Office when that office was established in 1994.

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## Weaknesses Remain in DOE's Safety Oversight at Fernald

Although the Fernald Area Office's oversight programs have improved, they still have weaknesses that limit DOE's ability to ensure that Fluor Daniel Fernald is fulfilling applicable safety and health requirements. Problems include weak planning of assessment activities, slow progress in ensuring that some key oversight staff are properly qualified, and weak processes for ensuring that identified safety problems are adequately corrected. The Fernald Area Office is initiating or planning a number of improvements to address these weaknesses, but it is too early to determine whether these actions will completely eliminate them.

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## Planning of Oversight Activities Is Weak

Although a May 1996 report on environment, safety, and health programs at Fernald by DOE's ES&H Office found the safety management at Fernald to be effective, it found several areas where improvements were needed.<sup>2</sup> One of these areas is the Fernald Area Office's planning of its assessment activities that have not been integrated or systematic. For example, the Fernald Area Office has not fully implemented its Compliance Assurance Plan—the section of the Technical Management Plan which outlines what assessments it must perform. Some areas, such as radiation protection and the conduct of operations, have been covered well. Others, however, such as waste management and occupational medical program performance, were not covered until the fiscal year 1997 plan, according to DOE.

Furthermore, we found that the Fernald Area Office has not planned the oversight activities of its facility representatives well. DOE's facility representatives are responsible for monitoring the performance of their facility and its operations and serve as DOE's primary points of contact with the contractor. Despite their important role, the Fernald Area Office has no rigorous process in place to ensure that its facility representatives cover various functional areas as they carry out their monitoring responsibilities. For example, the Fernald Area Office's program does not have an assessment schedule to govern the work of its representatives as

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<sup>2</sup>Independent Oversight Evaluation of Environment, Safety, and Health Programs, Fernald Environmental Management Project, Office of Oversight, Environment, Safety, and Health; U.S. Department of Energy (May 1996).

called for by DOE's Standard on Facility Representative Programs, the Ohio Field Office's procedures regarding facility representative programs, and the Fernald Area Office's own plan for its facility representative program. The purpose of such a schedule is to ensure that the facility representatives conduct a comprehensive and systematic review, through assessments and surveillances, of all aspects of the facility's operations over an established period of time.

According to the head of the Fernald Area Office's Safety and Assessment Office, the facility representatives have primarily conducted walk-throughs of facilities rather than more formal assessments and surveillances because, as of August 1996, four of the six representatives had not yet fulfilled basic qualification requirements and were not yet ready to conduct these types of reviews. Instead, other Safety and Assessment Office staff have performed assessments and surveillances of the contractor. The Fernald Area Office has developed an assessment schedule that delineates what assessments these other staff must perform, but it has not developed a schedule for surveillances. According to the head of the Safety and Assessment Office, the Fernald Area Office does reactive surveillances in response to problems that arise instead of planning them in advance.

Although the Fernald Area Office's facility representatives focus on conducting walk-throughs of their assigned facilities, these walk-throughs are unstructured because the representatives have not developed guidelines for performing them, as called for by the Ohio Field Office's procedures on facility representative programs. The purpose of such guidelines is to ensure that information is gathered systematically throughout a facility. According to the head of the Fernald Area Office's Facility Representative Program, the level of formality of the program has not yet evolved to that level.

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### Qualification of Facility Representatives Is Slow

We found that the Fernald Area Office has been slow in ensuring that its facility representatives complete basic qualification requirements. In spite of the Defense Nuclear Facility Safety Board's recommendation in June 1993 that DOE immediately establish a group of technically qualified facility representatives at Fernald, as of October 1996, only two of the agency's six representatives had completed qualification requirements. The qualification process involves the completion of a minimum of 6 months on-site, training regarding the site and specific projects/facilities, required reading, and one written and one oral examination. According to

staff of the Defense Nuclear Facilities Safety Board, the effectiveness of unqualified facility representatives could be hampered by their lack of familiarity with their facility or its processes.

The head of the Safety and Assessment Office explained to us that when he assumed direct responsibility for the facility representatives in January 1996, he had found that two of the facility representatives who had started in February and March 1995 were not very far along in fulfilling their qualification requirements. He then hired three more in January and February 1996. He has concentrated on correcting delays in training since taking responsibility for the program. After we completed our fieldwork, the Fernald Area Office told us that as of November 1996, five of the six facility representatives had completed their qualification requirements.

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### Processes to Ensure That Identified Problems Are Corrected Are Weak

Although the Fernald Area Office has increased the number of assessments and surveillances that it produces and transmits these to the contractor for action, the office has not yet instituted processes that ensure that the contractor adequately corrects problems that the Fernald Area Office has identified in these reviews. For example, the Fernald Area Office has lacked a system for tracking the status of assessment and surveillance findings and showing trends in identified deficiencies. Consequently, the office has not had readily available information on what safety and health problems it has identified and the current status of these problems. The May 1996 report on Fernald by the ES&H Office also identified weaknesses, such as the inadequate verification of corrective actions and inadequacies in the oversight of the contractor's corrective action processes.

Furthermore, the Fernald Area Office's facility representatives generally do not formally document their findings. The representatives usually relay their findings to the contractor verbally rather than in formal reports. The representatives are instructed to record their daily or weekly observations in their log books, which are informal records of their activities and are not transmitted to the contractor. According to the Fernald Area Office's Associate Director for Safety and Assessment, although the facility representatives are not required to prepare field observation reports,<sup>3</sup> they have recently been doing so to a greater extent. The Fernald Area Office's Office of Safety and Assessment intends to document these field

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<sup>3</sup>As noted earlier, field observation reports are prepared by the Fernald Area Office's staff on the basis of walk-throughs of facilities. The Fernald Area Office provides the contractor with copies of these reports but does not expect action to be taken on them.



observation reports in its new tracking and trending system, once it is implemented.

The lack of formal reporting by the Fernald Area Office's facility representatives is contrary DOE's Standard on Facility Representative Programs and the Ohio Field Office's procedures on facility representative programs, which both call for periodic formal reporting by facility representatives. The purpose of this reporting is to transmit findings and follow-up items from surveillances and walk-throughs to the contractor and area office management. Such reporting helps DOE realize the maximum benefit from its facility representative programs.

As a result of the above weaknesses, the Fernald Area Office's ability to ensure that identified problems are adequately corrected has been limited. For example, in the case of maintenance activities, the Fernald Area Office found in April 1995 that the contractor had problems in maintaining compliance with procedures and maintenance controls throughout the site and requested that these problems be corrected prior to the next assessment. During the next assessment in November 1995, however, the Fernald Area Office found that these problems continued. Although the Fernald Area Office again requested that the contractor correct these problems, the ES&H Office found in May 1996 that the site still had significant and pervasive problems with maintenance. Problems included nonadherence to procedures and deficient procedures. In some cases, continuing problems have or could have adversely affected operations, safety equipment, and workers. For example, two sitewide power outages in January 1996 (one of which resulted from a fire) were attributable to inadequate maintenance of facilities at the site. The consequences of these events included damage to equipment and delays in work activities.

Our examination of DOE's performance evaluations of Fluor Daniel Fernald for determining award fees has shown that the Fernald Area Office has used this mechanism to hold Fluor Daniel Fernald accountable for improving its performance in protecting workers from radiation. However, the office has not effectively used award fees to hold the contractor accountable in some other key areas. For example, the performance evaluation for the period October 1995 to March 1996 rated Fluor Daniel Fernald's overall safety performance as excellent but did not include the contractor's performance in correcting maintenance problems as a

criterion.<sup>4</sup> In addition, although the May 1996 ES&H Office's report cited electrical safety as another area needing improvement, the performance evaluation of the contractor's safety performance for the period October 1995 to March 1996 did not include electrical safety as a criterion in rating the contractor.

An emphasis in the award fee process on meeting deadlines, combined with an inadequate emphasis on safety performance, can lead the contractor to develop a "rush mentality" that could compromise safety. This problem has been noted in two reports on Fernald. A September 1995 report by DOE, Fluor Daniel Fernald, and consultants reported that an emphasis on meeting project target dates at Fernald contributed to a breakdown in contamination control and an increase in personnel contaminations in July and August 1995. In its May 1996 report on Fernald, ES&H noted that "Due to the strong emphasis on cost and schedule . . . items not directly identifiable in the critical path, such as maintenance activities, are being assigned a low priority and given minimal funding. Deferral of these items may have a negative synergistic impact on site safety and infrastructure and, therefore, on the ten-year baseline."

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**Planned Improvements Are  
Intended to Address These  
Weaknesses, but May Not  
Fully Resolve Them**

The Fernald Area Office is continuing its efforts to strengthen its oversight programs and is in the process of instituting or planning improvements aimed at addressing the weaknesses cited above. The office initiated several of these efforts in response to the May 1996 ES&H Office report. It is not yet clear, however, whether these actions will fully resolve the problems discussed here.

Actions underway or planned include the following:

- To plan its assessment activities in a more integrated manner, the Fernald Area Office is revising its Technical Management Plan to include a new master schedule of its assessment activities. This schedule will specify what assessments are required for each functional area. The office plans to assess each functional area at least once per year.
- Regarding the planning of the facility representatives' oversight activities, the Fernald Area Office's Associate Director for Safety and Assessment has told us that the office plans to develop a more formalized schedule for the representatives' work. This schedule would indicate what areas they

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<sup>4</sup>The evaluation for this period, under the "Least Cost, Earliest, and Final Cleanup" section, did give Fluor Daniel Fernald an unsatisfactory rating for deficiencies in its Annual Maintenance Work Plan. The evaluation noted that a detailed plan is needed to establish efficient staffing and budgeting and to counteract large budget overruns. However, this is a cost and schedule issue rather than a safety issue.

should be covering during their walk-throughs as well as through surveillances and assessments.

- To accelerate the formal qualification of its facility representatives, the Ohio Field Office set a goal of qualifying all of them by November 30, 1996. The Fernald Area Office has been working toward this goal, and by December 31, five out of the six representatives were qualified.
- To improve its oversight of Fluor Daniel Fernald's corrective action processes, the Fernald Area Office audited the contractor's corrective action program in August 1996. The office found that in responding to assessments, Fluor Daniel Fernald had failed to identify the root causes of problems and actions taken to prevent their recurrence.
- To improve its ability to track and show trends in safety and health problems that it identified, the Fernald Area Office is implementing a new tracking database. According to the Fernald Area Office's Associate Director for Safety and Assessment, this database will allow the Fernald Area Office to document and track the status of findings generated by its staff and to show trends in observations of deficiencies to identify adverse performance trends. Field observation reports generated by the facility representatives will be included in this database.
- Regarding the use of the award fee process to hold the contractor accountable for weak safety performance, the Fernald Area Office included new detailed criteria pertaining to Fluor Daniel Fernald's maintenance performance and corrective action processes in its performance-based fee determination plan for the period October 1, 1996, through March 31, 1997. For example, the plan includes as a criterion the extent to which occurrence reports identify the root causes of problems and effective corrective actions. An occurrence is an abnormal event or condition at a DOE owned or operated facility that has the potential to significantly affect safety and health or the environment.

Because the above initiatives are still either in the planning or early implementation stages, it is too early to determine whether they will be successful in eliminating the remaining weaknesses in the Fernald Area Office's safety and health oversight programs. However, in some areas, it appears that the actions taken so far by the Fernald Area Office have been limited and may not be adequate to resolve existing problems. In particular, the Fernald Area Office's actions with regard to the planning and documentation of its facility representatives' work and the use of its award fee process to motivate improvements in the contractor's safety performance may not go far enough to eliminate past weaknesses in these areas.

## Allegations Concerning Safety and Health Problems at the Site

From February through May 1996, the Cincinnati Enquirer made numerous allegations about health and safety problems that occurred at the Fernald site since January 1993. Many of these were taken from DOE's Occurrence Reporting and Processing System (ORPS). As a method of monitoring the safety of the workplace, DOE requires its contractors to establish a reporting program for the timely identification, categorization, notification, and reporting of occurrences at DOE facilities. DOE's ORPS was developed for this purpose.

### Allegation: More Than 1,000 Serious Safety-Related Problems Have Occurred Since January 1, 1993.

Although Fluor Daniel Fernald reported many safety-related occurrences, we did not find evidence to support the number stated in the allegation. According to the Cincinnati Enquirer reporter responsible for writing the allegations, the number of safety-related problems was based on occurrence reports, workers' reports of injuries through medical offices, and Fluor Daniel Fernald's internal reports, such as electronic mail and radiation technical reports. He said he could not provide the documentation to support the number because that would endanger his sources.

To determine the number of serious safety-related problems at Fernald, we used DOE's ORPS because the system contains the most safety-significant events that have occurred at Fernald and other DOE sites. The ORPS system contains 317 occurrence reports from January 1, 1993, to February 12, 1996 (the day of the Cincinnati Enquirer article), which are categorized as either emergencies, unusual occurrences, or off-normal occurrences. Of these 317, only 1 was categorized as an emergency.

Emergency occurrences are the most serious events that could endanger or adversely affect people, property, or the environment. The one emergency occurred in October 1994, when a tractor trailer carrying low-level waste from Fernald to the Nevada Test Site was involved in a traffic accident and overturned. The accident occurred in Missouri, and no contamination was released.

Fifty-seven occurrences were categorized as unusual. An unusual occurrence has a significant or potential impact on safety, environment, health, security, or operations, such as releases of radioactive or hazardous materials above established limits, fatalities, or significant injuries.

Two hundred fifty-nine occurrences were categorized as off-normal. An off-normal occurrence adversely or potentially affects the safety, security, environment or health of a facility, such as contamination of personnel or their exposure to contaminants, operational procedural violations, or identification of actual or potential defective items, material, or services that could impose a substantial safety hazard.

Allegation: Seventy-Eight Contamination Incidents Occurred.

Although Fluor Daniel Fernald was having problems with contamination, the allegation overstated the number of contaminations. According to ORPS, Fernald had a total of 69 contamination occurrences<sup>5</sup> from January 1, 1993, to February 12, 1996, the date of the allegation. They included 51 personnel contaminations, which can be contamination of the skin or clothing. The remaining 18 were other types of radioactive contamination, such as the lost control of radioactive material or the spread of contamination.

The practices for conducting DOE radiological operations are contained in DOE's Radiological Control Manual. Radiation protection standards, limits, and program requirements for protecting individuals from radiation are contained in 10 C.F.R. 835.

During 1995, Fernald was experiencing problems with radiological control, according to several DOE assessments. For the period April 1 through September 30, 1995, Fluor Daniel Fernald received a rating of unsatisfactory from DOE for the performance criteria of reducing the number of radiological occurrences. Also, in April 1995, site residents of DOE's ES&H found that the failure to properly control radioactive material was an ongoing problem at Fernald and in July 1995 noted that the incidence of personnel contamination events increased, including contamination on the soles of employees' shoes and contractor-issued pants.

As a result of the increased personnel contamination events in 1995, a team of radiation professionals, including DOE, Fluor Daniel Fernald, and consultants investigated and reported on the site's contamination control program.<sup>6</sup> The team found that among other things, the workforce's knowledge of the limitations of personal protective clothing (also called

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<sup>5</sup>DOE's ORPS system does not use the term contamination incident. Reported contaminations are included as occurrences.

<sup>6</sup>"Investigation of Radiological Control Program Trends Final Report" (Sept. 27, 1995).

anticontamination clothing) was poor. In addition, the team reported that during July and August, when personnel contamination events were determined to be related to the wearing of single anticontamination clothing, Fluor Daniel Fernald was reluctant to react quickly to use double anticontamination clothing. The team believed that the reluctance was due to Fluor Daniel Fernald's concern that it might jeopardize meeting an award fee milestone because of the work-rest regimen that employees must use when wearing double anticontamination clothing.

According to several assessments in 1996, the program had improved. For the period October 1, 1995, through March 31, 1996, Fluor Daniel Fernald received a rating of satisfactory from DOE for the performance criterion of reducing radiological occurrences. When a February 15, 1996, ES&H report looked at personnel contamination events per 100 staff years at Fernald compared with that of other comparable DOE remediation sites, it concluded that while the type and number of occurrences indicated weaknesses in Fernald's Radiological Controls Program, the rate of occurrences was not excessive when compared with that of those remediation sites.

The May 1996 ES&H Oversight report found that although clear safety policies and goals have been established at Fernald, an area that required strengthening was a continued policy emphasis on occupational and environmental as low as reasonably achievable (ALARA) goals and objectives.<sup>7</sup> The Fernald Area Office's and Fluor Daniel Fernald's response to this was that DOE and Fluor Daniel Fernald would improve management's involvement and commitment to ALARA.

The Fernald Special Project Team's report stated that it found all of the elements of a comprehensive radiation safety program to be in place and functioning. The report also stated that 9 of the 78 incidents did not include contaminants and that workers were primarily exposed to low-level "nuisance" contamination left over from the early days of the site's operations.

Allegation: Seven Criticality Incidents Occurred Where Drums of  
Radioactive Waste Were Stored Too Closely Together.

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<sup>7</sup>According to the DOE Radiological Control Manual, ALARA is defined as an approach to radiological control to manage and control exposure to the work force and to the general public at levels as low as is reasonable. It is a process that has the objective of attaining doses as far below the applicable controlling limits as is reasonable achievable.

ORPS contains seven occurrence reports on criticality safety violations from September 1993 through June 1995, two of which related to drum storage spacing. None of these were criticality incidents as defined by DOE. A criticality incident is the release of energy as a result of accidentally producing a self-sustaining or divergent neutron chain reaction.<sup>8</sup> According to a June 1995 ES&H assessment, the likelihood of an inadvertent criticality incident at Fernald, while possible, was small because of the physical nature of the enriched nuclear material there. The seven violations of criticality safety procedures include: two occurrences of drums being stored too close together, two in which drums were missing, one in which the drum was in an unapproved storage location, one in which the drums were stored so that they blocked a radiation detection alarm, and one in which the drums were mislabeled and as a result stored in an inappropriate place.

Audits and assessments of the criticality safety program at Fernald, conducted during 1994 and 1995, repeatedly found the program to be deficient. Fluor Daniel Fernald received an unsatisfactory rating from DOE for its nuclear criticality program for the period April 1 through September 30, 1994. For the next period, October 1, 1994, through March 31, 1995, DOE stated that substantial improvements were required across this entire program before it could reach a satisfactory level of performance.

In addition, a March 1994 independent audit of Fernald's nuclear criticality safety found that the nuclear criticality safety program was well documented but that the implementation was less than adequate. The Fernald Area Office also found problems with Fluor Daniel Fernald's criticality safety program in October 1994 and concluded that timely and rigorous corrective actions for improving the conduct of operations in the criticality safety program were not being aggressively undertaken. In June 1995, the Fernald Area Office again found major shortcomings in this program; for example, required criticality safe-operating limits were not properly posted at access points for several buildings, and contractor personnel lacked knowledge about criticality areas.

By 1996, several assessments of Fluor Daniel Fernald's nuclear criticality safety program reported improvements in the program. For the period April 1 through September 30, 1995, DOE found that Fluor Daniel Fernald took effective actions to address specific concerns with the criticality program on-site and by the end of the reporting period, improvements

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<sup>8</sup>A chain reaction occurs when uranium-235 splits apart (fission) causing more fission. If the chain reaction continues, large amounts of heat and radiation are given off.

were observed. Furthermore, for the period October 1, 1995, through March 31, 1996, the DOE performance evaluation committee's report stated that Fluor Daniel Fernald demonstrated excellence in the criticality safety program following external assessments.

Furthermore, a February 2, 1996, Fernald Area Office's report found that the criticality safety program had moved beyond the inadequate rating and currently met DOE's requirements. In addition, the May 1996 ES&H oversight evaluation report stated that Fluor Daniel Fernald's criticality safety program was strong and well documented but that improvement in training and technical competence is needed.

Also, the Fernald Special Project Team Report stated that the criticality safety program of Fluor Daniel Fernald has been transformed in the last 6 months into a satisfactory and functional program and found that the improved storage of enriched uranium effectively mitigates the potential for a criticality accident and minimizes the potential to violate control procedures.

**Allegation: Using Thousands of Counterfeit or Substandard Fasteners and Bolts Created a Life-Threatening Situation.**

Although Fluor Daniel Fernald identified many suspect and/or counterfeit parts, these parts have been a concern in the United States since the middle of the 1980s, when they were found in such places as aircraft, nuclear weapon production facilities, and buildings. These bolts do not possess the capabilities of the genuine bolts that they counterfeit and can threaten the reliability of the industrial and consumer products, national security, or human lives. In August 1992, DOE issued a quality alert bulletin that highlighted the concerns associated with such parts, provided guidance on their identification, and directed its field offices to take certain actions. According to DOE in a May 1996 report, there have been no reported instances of accidents or near-misses within DOE as a result of suspect/counterfeit parts.

By September 1995, Fluor Daniel Fernald completed all of its inspections of facilities and mobile equipment. Out of a total of 37,527 parts inspected, 3,935 were considered suspect/counterfeit and 2,232 of these needed to be replaced. The contractor issued 56 work orders to replace the parts. As of November 1996, the contractor had completed 26 work orders and canceled 9 after doing engineering reevaluations. The 21 remaining work orders are for 321 parts.



In November 1995, the ES&H site representatives assessed the Fernald suspect and counterfeit parts policy and found that it was developed as instructed by DOE's Office of Environmental Management. However, the May 1996 ES&H oversight report found that the suspect/counterfeit parts program has not been adequately implemented because remedial work orders were not performed. Fluor Daniel Fernald responded that the remaining work orders will be scheduled and done as resources are available. Fluor Daniel Fernald expects to complete replacement activities by September 1, 1997.

The Fernald Special Project Team Report stated that the team was confident that the current counterfeit bolt inspection program implemented by Fluor Daniel Fernald was effective. The team stated that in the past 2 years, crews at Fernald have been inspecting the site and looking for suspect bolts. When counterfeit bolts are found in load-bearing or structural applications, the bolts have been replaced. Also, no safety events or equipment failures related to counterfeit bolts have occurred at the Fernald site.

Allegation: Workers Who Were Impaired by Drugs or Alcohol and Repeat Offenders Were Allowed to Keep Their Jobs.

Although some employees have tested positive for drugs and alcohol, Fluor Daniel Fernald's records show that repeat offenders are terminated.

In September 1994, the Fernald Area Office approved Fluor Daniel Fernald's substance abuse program. The program included random testing for controlled substances and alcohol, testing for reasonable suspicion, and preemployment testing. Fluor Daniel Fernald's substance abuse policy is that if a person tests positive for the use of controlled substances, an appointment is made for the employee to enter the employee assistance program. After the employee completes the program's treatment and upon receipt of a negative substance abuse test, the person is permitted to return to work. Later, the employee is tested on an unannounced basis. If this test is positive and the person is a Fluor Daniel Fernald employee, the person's employment is terminated. If the person is a subcontractor employee, that person's access to the Fernald site is permanently denied.

Fluor Daniel Fernald's reporting system indicates that some workers tested positive for substance abuse in random testing, testing for reasonable cause, and testing after an accident. However, workers testing

positive after completing the rehabilitation program and returning to work were terminated.

In April 1995, Fluor Daniel Fernald started reporting occurrences of substance abuse in ORPS when it realized that a positive drug test result was considered an off-normal event. From April 1995 to February 1996, Fluor Daniel Fernald reported 32 occurrences of substance abuse. After a second positive drug test, 11 workers were either terminated or permanently denied access to the site.

As of July 1995, Fluor Daniel Fernald revised its employment procedures to require its new employees and subcontractor applicants to receive a confirmed negative result for drug testing before being issued a badge and reporting for work. In October 1995, Fluor Daniel Fernald reported to the Fernald Area Office on the increased trends in substance abuse reports at Fernald. It attributed the increased reporting to the following: (1) the positive drug-screening results were to be reported in the ORPS system and (2) the number of positive results from pre-access drug screens increased. In 1995, of the 894 subcontractor people tested, 39 (4.4 percent) tested positive. From January through October 1996, of the 697 subcontractor people tested, 22 individuals (3.2 percent) tested positive.

The Fernald Special Project Team Report provided information on the Fluor Daniel Fernald substance abuse program as we described above and concluded that the employees identified are the positive result of an effective substance abuse program.

The Fernald Area Office plans to do an assessment of Fluor Daniel Fernald's substance abuse program in the spring of 1997.

Allegation: Fluor Daniel Fernald Has Intimidated Workers to Prevent Them From Reporting Safety Concerns.

We did not find evidence to support this allegation. Both DOE and Fluor Daniel Fernald have employee concern programs to identify and resolve safety, health, and environmental concerns raised by employees, and some employees are reporting such concerns. The programs consist of hotline numbers for the employees to call to report concerns and forms that employees can complete and submit anonymously. From January 1995 through September 1996, Fluor Daniel Fernald received 85 hotline calls and 51 written concerns that were recorded in the safety suggestion log.

For the same period, the Fernald Area Office received three hotline calls and eight written concerns.

A Fernald Area Office September 5, 1995, assessment found that the employee concerns hotline phone had a caller identification feature which did not protect the caller's anonymity. According to the Fluor Daniel Fernald official responsible for its safety concerns program, this situation was corrected in October 1995 with the installation of a conventional phone without caller identification and a conventional add-on answering machine that eliminated the potential for identification of the caller.

In addition to having employee concerns programs for reporting safety concerns, employee involvement in safety is available through the Safety First program. The Safety First program is an ongoing initiative that was created in 1994 to improve the safety culture at Fernald through creating an atmosphere that encourages employees at all levels of the organization to take ownership of safety. A part of the Safety First initiative is the work group concept, which consists of a group of workers working on a task with a common supervisor that meet at the beginning of each day for 5 to 15 minutes to discuss safety issues and work concerns. The May 1996 DOE-ES&H Independent Oversight Evaluation Report concluded that the Safety First initiative and the associated safety work groups promote worker participation and empowerment and are operating effectively.

In addition, Fluor Daniel Fernald has conducted several surveys of employees' attitudes toward safety at Fernald—two in 1994 and one in 1995. The first survey was conducted during a May 1994 safety stand-down when employees stopped routine activities to examine their work areas and identify risky operations and unsafe conditions. The second and third surveys were conducted during August and September 1994 and from April through September 1995, respectively, as follow-ups and to satisfy a Fluor Daniel Fernald performance objective criterion established by the Fernald Area Office. Fluor Daniel Fernald is continuing to survey workers; however, it does not plan to analyze and report the results until 1997.

Two questions in the employee attitude surveys related to workers' attitude. Table II.2 shows how wage employees, i.e., union workers, responded to the questions.

**Appendix II**  
**Information on DOE's Oversight and Safety**  
**and Health Activities and Allegations of**  
**Safety and Health Problems at Fernald**

**Table II.2: Responses to Question**  
**"Would You Agree That You Have the**  
**Freedom to Identify and Report Safety**  
**Concerns in Your Work Area?"**

Responses in percentages			
Response	Survey 1	Survey 2	Survey 3
Strongly agree	15	37	46
Agree	61	52	44
Disagree	21	9	8
Strongly disagree	3	2	2

Source: Fluor Daniel Fernald.

**Table II.3: Responses to Question "in**  
**General, Is FEMP a Safer Place to**  
**Work Than It Was One Year Ago?"**

Responses in percentages			
Response	Survey 1	Survey 2	Survey 3
Strongly agree	5	9	7
Agree	50	58	64
Disagree	38	29	27
Strongly disagree	7	4	2

Legend:  
FEMP = Fernald Environmental Management Project

Source: Fluor Daniel Fernald.

**Allegation: Workers Were Forced to Wear Torn, Ill-Fitting, or Improper**  
**Protective Clothing.**

Although DOE's assessment found some personal protective clothing in poor condition, we did not find evidence to support that workers were forced to wear this.

According to the DOE Radiological Control Manual anticontamination clothing is worn when workers handle materials contaminated with removable contamination<sup>9</sup> in excess of certain levels and for work in contaminated, highly-contaminated, and airborne-radioactivity areas. The clothing consists of such items as coveralls, gloves, rubber overshoes, and hoods. Both DOE's manual and Fluor Daniel Fernald's procedures require that individuals inspect their anticontamination clothing prior to use for tears, holes, or split seams that would diminish protection and replace defective items with intact clothing. Also, contractor-issued clothing, such

<sup>9</sup>Removable contamination is radioactive material that can be removed from surfaces by such means as casual contact, wiping, brushing, or washing.

as work coveralls and shoes, should be considered the same as personal clothing and should not be used for radiological purposes.

During a walk-through of a pilot plant in April 1996, the Fernald Area Office's support contractor observed that much of the anticontamination clothing was in unsatisfactory condition with tears and missing buttons. As stated above, workers are to inspect the anticontamination clothing for defects and to reject unacceptable clothing. As a follow-up, the support contractor visited several other plants at the site and inspected the anticontamination clothing for general condition and integrity. The support contractor found that all other anticontamination clothing was in satisfactory condition with no observed defects and that a significant amount of the clothing appeared new. The support contractor concluded that the condition of the anticontamination clothing at the pilot plant was an isolated case.

From January 1995 through September 1996, four complaints in the Fluor Daniel Fernald safety suggestion log dealt with clothing. In one case, the person wanted larger-sized clothing of a particular type. The person was informed that this type of clothing did not come in a larger size than was already available. In another case, the laundry erroneously sent bags of contaminated shoe covers back to the user. According to Fluor Daniel Fernald, the problem was addressed by the supervisor to prevent this from happening in the future. In the two other cases, the complaints were about contractor-issued clothing, including a complaint that employees cannot get correct sizes and the clothing is a hazard to wear. Contractor-issued clothing is not considered anticontamination clothing by DOE or Fluor Daniel Fernald. Fluor Daniel Fernald responded that it has bought over 300 sets of coveralls for employees to use and that the quantities and types of clothing are continuously under review. Fluor Daniel Fernald considers each of these employee concerns to be closed.

Allegation: Radiation Safety Training Decreased and Full Radiation Training Was Eliminated for Most Subcontractor Employees.

The radiation safety training requirements have not changed, nor has full radiation training been eliminated for subcontractor employees. However, Fluor Daniel Fernald did eliminate redundancies in the training courses, which resulted in a reduction in the number of hours of training. The May 1996 ES&H Oversight report stated that Fluor Daniel Fernald's training programs met applicable requirements. In addition, a DOE official told us

that Fluor Daniel Fernald's training was sufficient under DOE orders and the DOE Radiological Control Manual.

Chapter 6 of the DOE Radiological Control Manual establishes the requirements to ensure that personnel have the training to work safely in and around radiological areas. The training requirements apply to all personnel entering DOE sites. The manual establishes standardized core course training and the required hours, including general employee radiological training (1 hour), radiological worker I training (8 hours), and radiological worker II training (16 hours). The required number of hours of course work has not changed since DOE issued the Radiological Manual in 1992, revised it in 1994, and revised it again in 1996. Fluor Daniel Fernald has adopted the DOE Radiological Control Manual requirements for training its workers.

In addition, an Occupational Safety and Health Administration requirement for employees working at hazardous waste clean-up sites is hazardous waste operations and emergency response training. Workers receiving radiological worker I and radiological worker II training also receive the requisite number of hazardous waste operations and emergency response training hours.

According to Fluor Daniel Fernald, when it took over the Fernald site in December 1992, it evaluated the requirements for access to the site and as a result streamlined the compliance training. Where compliance training amounted to nearly 90 hours per employee working in restricted areas, the number of hours was reduced to 40. According to a Fluor Daniel Fernald official, previously there were separate courses for hazardous waste operations and emergency response and radiological control. Fluor Daniel Fernald looked at these two training programs and saw much commonality in such areas as hazard recognition and personal protective equipment. With the removal of the redundancies, the courses were pared down to their current number of days.

According to Fluor Daniel Fernald's radiological control requirements, everyone entering the controlled area is to be trained in the aspects of radiation protection to a level commensurate with their potential for exposure to radiological hazards. The training requirements also apply to subcontractor employees. According to Fluor Daniel Fernald, as of October 1996, 63 percent of workers employed by subcontractors received radiological worker II training, 17 percent received radiological worker I training, and 20 percent received the general employee radiological

training only. This compares with Fluor Daniel Fernald's wage workers, of whom 82 percent received radiological worker II training, 9 percent received radiological worker I training, and 9 percent received the general employee radiological training only.

Allegation: Fluor Daniel Fernald Failed to Keep Inspection Records of Hazardous and Radioactive Wastes.

A Fluor Daniel Fernald environmental compliance surveillance found problems with inspection records for hazardous waste management units.<sup>10</sup>

The Ohio EPA requires that owners or operators inspect areas where containers of waste are stored or were formerly stored. The owners or operators are to look for leaks and for deterioration caused by corrosion or other factors. They are also required to record inspections in an inspection log and keep these records for at least 3 years from the date of inspection.

Fluor Daniel Fernald has inspection procedures and record keeping requirements for hazardous waste management units. The procedures are for completing the inspection logs and performing inspections of container storage areas, equipment, above-ground storage tanks, and landfills that contain such wastes. The site has 32 hazardous waste management units that are inspected on a daily, weekly, monthly, or quarterly basis.

In a February 1996 environmental compliance surveillance of its hazardous waste management unit program, Fluor Daniel Fernald's Office of Environmental Compliance found, among other things, missing inspection logs, a lack of corrective actions being performed or noted, and inspectors who did not have the required training conducting the inspections. For the active storage units, 47 of the 627 (7 percent) required inspection logs were missing; for the inactive storage areas, 93 of the 2,031 (5 percent) required inspection logs were missing.<sup>11</sup> After further investigation, Fluor Daniel Fernald found that although many of the inspections had actually been completed, the logs had not been submitted for filing in the operating record.

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<sup>10</sup>A hazardous waste management unit is an identifiable area where hazardous waste is or has been treated, stored (for more than 90 days), or disposed of, or systematically released into the environment. In some cases, radioactive material is or was stored at these units.

<sup>11</sup>An active storage area has waste currently present; an inactive storage area has no waste present, but waste was previously stored there.

As a result, the Fluor Daniel Fernald Environmental Compliance office required the person responsible for the facility to provide the missing inspection records and to follow up to ensure that corrective actions were taken. After trying to recover the missing inspection logs, some were recovered but a number will probably never be. Also, hazardous waste management unit inspectors were required to complete hazardous waste management unit training. In a March 15, 1996, letter, Fluor Daniel Fernald informed the Ohio EPA of the results of the surveillance and its actions to correct the deficiencies.

In an April 5, 1996, letter, the Ohio EPA stated that the Fernald Environmental Management Project was in violation of the Ohio administrative code and DOE's agreement with the state. The Ohio EPA also stated that while it was concerned with the violation, the situation did not appear to result in a threat to site workers, the public, or the environment. DOE and Fluor Daniel Fernald responded in an April 19, 1996, letter, that compliance personnel would perform weekly checks of the hazardous waste management unit areas and examine the operating records to ensure that inspections were being performed and that the documentation was placed in the operating record. A Fluor Daniel Fernald environmental compliance official told us that the contractor is continuing to review the inspection records.

Allegation: Drums of Radioactive and Other Toxic Liquids Leaked During Weekends. The Number of Leaks Was Underreported.

According to Fluor Daniel Fernald, drums found to be leaking on the weekends were mitigated within the 24 hours required by the Ohio EPA. However, the number of leaky drums was underreported.

The plant 1 pad is a storage area that was used for storing uranium-bearing material destined for recycling into production. In the mid-1980s, the drum population on the pad increased because material that had formerly been sent to waste pits was drummed and stored at plant 1. The outside storage resulted in significant deterioration of the steel drums because of weathering. Fluor Daniel Fernald has been overpacking the deteriorated drums into new containers.<sup>12</sup>

According to the Ohio EPA, all containers on the plant 1 pad are to be inspected daily for leakage. Type I drums—those having a leak through the container to the pallet and/or ground—are recorded on the container

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<sup>12</sup>Overpacking is placing one or more smaller defective containers into a larger container.



inspection form. For any drums that are actually leaking, DOE is required to immediately contain the release or spill after detection but not more than 24 hours after discovery. Mitigation can include patching the leak if possible, transferring the materials from the leaking drum, and overpacking the leaking drum. Any spill is controlled with dikes of sorbent materials.

Fluor Daniel Fernald admitted that it underreported the number of leaky drums to the Cincinnati Enquirer. For calendar year 1995, out of 84 type I drums that should have been reported to the Assistant Emergency Duty Officer (AEDO) 33 were reported. From January through March 6, 1996, 24 out of 28 type I drums were reported. Fluor Daniel Fernald stated that it took corrective actions, such as conducting training for supervisors and developing a checklist for tracking follow-up actions.

According to Fluor Daniel Fernald, of the 84 type I drums that should have been reported in 1995, 10 occurred on the weekends. For nine of these, weekend drivers were scheduled and available to move the drums. For the remaining one, no drivers were scheduled or called in, but Fluor Daniel Fernald stated that the drum was moved within 24 hours. Of the 28 type I drums found from January through March 6, 1996, 1 occurred on the weekend. Fluor Daniel Fernald states that the leak was mitigated the same day, Saturday, and that the drum was moved to the overpack area on Monday.

On Saturday, March 9, 1996, Ohio EPA visited the site to investigate allegations regarding leaky drums. The review was directed primarily at container storage on the plant 1 pad. The Ohio EPA stated that visual observation of both mixed waste and radiological waste containers stored indoors and outdoors on the plant 1 pad did not reveal any leaking containers.

# Information on Weaknesses in Fernald's Performance and Financial Systems

Because of alleged deficiencies in Fluor Daniel Fernald's performance reporting and financial management systems, we were asked to review certain practices in these systems, including whether key aspects of the contractor's systems were functioning properly and, if not, how such weaknesses could affect DOE's oversight. Because the allegations were generally broad and lacking specificity, we did not investigate specific allegations. Rather, we grouped the allegations into two major areas of concern: (1) control of the changes in the cost and schedule of projects against which the contractor's performance is measured, called the performance measurement baseline, and (2) key practices in the contractor's financial management system in which all of the costs are accumulated. We also provided numerous opportunities for workers and individuals from the Fernald area to provide us with information about possible financial or performance reporting improprieties. (See app. VI for more information on our methodology.) We did not receive specific evidence from workers and other concerned individuals that provided enough detail to warrant expanding our investigation.

Fluor Daniel Fernald complied with some of the financial and performance reporting procedures that we reviewed, but was not in compliance with some others, which makes it difficult for both DOE and contractor managers to exercise effective control and/or oversight of the contractor's costs and performance. In controlling the performance measurement baseline, proposals for changes that did not represent new or additional work were appropriately disapproved. The documentation in the contractor's proposals to change the baseline was usually adequate to support the change. However, the impact of changes on work at the site was not as well documented, and the required funding information was not always present. Furthermore, some procedures are not clearly written and do not require certain information that would make review more efficient. In part, these occurrences may be due to a heavy reliance by the DOE Fernald Area Office's managers on less-formal channels of communication with the contractor, such as verbal presentations and phone calls rather than formal documentation of all actions.

The financial system will accept charges against accounts that have been properly closed. In addition, the financial system allows closed accounts to be reopened without the approval of the control account managers. Such actions hamper the effective control of accounts by these managers. Because DOE relies on both the baseline and financial information in these systems, such weaknesses complicate DOE's oversight task.

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## Background

Managers of DOE's Fernald Area Office rely on the data from the contractor's Project Control System to monitor progress on projects, environmental studies, and other activities. Key components of the Project Control System include control of the performance measurement baseline and financial management.

Project Control System data, as well as work activities at the site, are organized around eight activity data sheets. They are basically project planning documents that contain summary technical, cost, and schedule information for controlling DOE's funding. Examples of activities on activity data sheets are a soils remediation project, groundwater remediation, and K-65 silos. Each activity data sheet is the responsibility of a DOE Fernald Area Office activity data sheet manager or team leader in the Office of Environmental Management. At the contractor level, Fluor Daniel Fernald's line managers, called control account managers, handle the day-to-day financial management and reporting processes.

The activity data sheet work is further broken down into control accounts that involve detailed tasks generally scheduled in the next 1 to 3 years. Examples of control accounts are remedial construction of the active flyash pile and silo remediation. Each control account is broken down into one or more charge numbers that represent specific tasks or units of work and constitute the lowest measurement level in the Project Control System. Examples of charge numbers include soil washing, waste water treatment, transportation and burial, and silo content remediation construction. Costs for work at the site are accounted for under the appropriate charge number within a specific control account. These charges are then accumulated into higher-level summaries, such as a summary of charges incurred at the activity data sheet level.

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## Baseline Change Control Process Not Always Adequate for Effective DOE Oversight

The current baseline change control procedures, as implemented, do not provide DOE with appropriate information to effectively oversee execution of the baseline. First, the documentation that we reviewed of changes to the baseline usually met the contractor's own requirements for clarity and completeness, except that the impact of changes is sometimes not well documented and that some funding information is missing. Second, procedures related to changes in the baseline are not clearly written and do not require some documentation that would make review more efficient. This may make it difficult for DOE to oversee the cost and schedule performance of projects affected by such changes. Although DOE's Fernald Area Office obtains additional oral explanation from the

contractor to fill the gaps in data, the formal documentation of such items as the impact of baseline changes is sometimes insufficient to support any later review.

The performance measurement baseline governs the expenditure of the site's budget, which was about \$266 million in fiscal year 1997, and defines what work has been authorized. It is the standard against which DOE assesses the contractor's cost and schedule performance.<sup>1</sup> The baseline, which is approved by the Fernald Area Office, can be adjusted to reflect changes that are not under the contractor's control, such as a change in the authorized level of funding, the addition or deletion of the scope of work in a project or activity, or changes in costs due to amended labor rates. However, the baseline should not be adjusted when cost or schedule changes occur as a result of the contractor's actions, such as the contractor's failure to meet the approved schedule because of poor performance. DOE's and the contractor's procedures define when and how the baseline should be adjusted.

Change proposals fall into one of five categories—approved, canceled, disapproved, in process, or tabled. From October 1, 1993, to May 31, 1996, Fluor Daniel Fernald processed 985 proposals to change the baseline, of which 699 were approved. Table III.1 shows the number of change proposals in each category by fiscal year.

**Table III.1: Number of Change Proposals From October 1, 1993, Through May 31, 1996, by Fiscal Year**

Fiscal year	Approved	Canceled	Disapproved	In process	Tabled	Total
1994	380	129	13	0	0	522
1995	233	80	20	0	0	333
1996	86	19	1	23	1	130
<b>Total</b>	<b>699</b>	<b>228</b>	<b>34</b>	<b>23</b>	<b>1</b>	<b>985</b>

### The Contractor Complies With Most Procedures but Not All

Fluor Daniel Fernald was in compliance with most of the written site procedures and policies for controlling the baseline but did not always comply with some information requirements. The contractor maintains records of all proposals to change the baseline and their dispositions. We found those records to be accurate and reliable. Fluor Daniel Fernald had the required documentation for all but one of the randomly selected

<sup>1</sup>The performance measurement baseline represents the sum of the budgets in all of the control accounts. It does not include control accounts for future work that is not yet authorized, such as management reserves or undistributed budget.

baseline change proposals we reviewed,<sup>2</sup> and the documentation was usually adequate to support the need for changing the baseline. Of the 114 change proposals we reviewed, we found 4 instances in which the documentation indicated that the change did not represent new or additional work. All four of those proposals were appropriately disapproved. In those instances, the baseline change approval process was functioning properly. However, on the basis of our sample, we estimate that about 12 percent of the baseline change proposals were missing some of the required funding information.<sup>3</sup>

The change proposal form is the formal record of the proposed change, although the manager requesting the change normally appears before the approving board to defend the proposal and answer questions. Site procedures require that each proposal to change the baseline contain clear and concise statements of the scope of the change, the justification or purpose of the change, and the impact of the change on activities at the site. The procedures also require that the sources of funds for additional work be identified on the change form.

We estimate that a few of the baseline change proposals did not contain sufficient narrative for a reviewer to understand the scope (about 3 percent), justification (about 8 percent), and/or impact (about 16 percent) of the change without additional explanation. In general, the documentation was better on change proposals that were approved than on those that had been disapproved. As previously stated, we estimate that about 12 percent of the proposals did not include all of the required funding information. However, we noted that documentation of the impact of changes and of funding sources was improved in the proposals for fiscal year 1996.

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### Current Procedures Have Ambiguities and Gaps That Hamper Oversight

Some written procedures are unclear, such as the approval level required for certain changes to the baseline, and do not require some documentation that would make review more efficient. For example, neither the contractor's nor the Fernald Area Office's written procedures require that the reasons for disapproval of proposals to change the baseline be formally documented on the proposal form or that changes to supporting documents be clearly marked.

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<sup>2</sup>Of the 115 randomly selected change proposals with forms, 1 proposal request was missing one page of the three-page form and was dropped from this analysis.

<sup>3</sup>Because the information for the baseline change proposals was developed from a statistical sample, the estimates have a measurable precision or sampling error. Appendix V provides the sampling errors for the estimates cited.

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**Appendix III**  
**Information on Weaknesses in Fernald's**  
**Performance and Financial Systems**

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When the baseline needs to be adjusted, a baseline change proposal is prepared by the responsible control account manager. The responsible party for approving a change proposal depends on the cost or schedule impact of the change.<sup>4</sup> Currently, baseline changes within an activity data sheet with a net impact of less than \$25,000 can be prepared and approved by the control account manager in charge of the activity. However, the control account managers cannot make changes that affect more than one activity data sheet without the contractor's and/or DOE's approval. Baseline changes with a net cost impact of less than \$250,000 or less than 30 days schedule impact can be approved and implemented without DOE's concurrence. (See table III.2.) Baseline changes over those thresholds can only be approved by DOE, either at Fernald or headquarters. Baseline changes below the threshold for DOE's approval are not formally reviewed by DOE personnel but are made available to them and can be questioned. However, Fernald Area Office officials were not able to identify any instances in which they had instructed the contractor not to implement a change on the basis of these "informational" copies. New or changed work scope is generally approved once the baseline change proposal has been approved at the highest level necessary. As a result of a recommendation made by the Special Project Team, the Fernald Area Office is in the process of revising the threshold levels, as shown in table III.2.

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<sup>4</sup>Schedule adjustments of key milestone dates are also done on change proposals.

**Appendix III**  
**Information on Weaknesses in Fernald's**  
**Performance and Financial Systems**

**Table III.2: Performance Measurement Baseline Dollar-Value Threshold Criteria for Changes Within a Single Activity Data Sheet**

Level	Current thresholds		Proposed thresholds	
	Scope	Signer	Scope	Signer
4	Less than \$25,000	FDF Control Account Manager	Less than \$25,000	FDF managers
3	\$25,000 to \$250,000 <sup>a</sup>	FDF manager	\$25,000 up to \$1 million	DOE ADS Manager
2	\$250,000 to \$5 million	DOE-FEMP Director	\$1 million up to \$25 million	DOE-FEMP Director
1	\$5 million to \$50 million	DOE-HQ	\$25 million up to \$50 million	DOE-HQ
0	More than \$50 million	DOE-HQ Acquisition Executive	\$50 million or more	DOE-HQ

Legend

ADS = Activity Data Sheet

FDF = Fluor Daniel Fernald

FEMP = Fernald Environmental Management Project

HQ = headquarters

<sup>a</sup>For fiscal year 1993 through August 1994, this threshold was \$1 million.

The site's written procedures for determining the approval level are not clear, and Fernald Area Office and contractor officials agree. In general, the approval level is determined by the net change in costs for all fiscal years covered by the proposal, although there are exceptions.<sup>5</sup> For example, if a change proposes moving \$50,000 from a management reserve account, which is not part of the baseline, to support the added scope of work to the baseline, the transfer is not categorized by the net change. On the other hand, if a change proposes moving the same amount from one charge number within a control account to another charge number in the same control account, the net change is used to determine approval. Similarly, if a change proposal lists costs for more than 1 fiscal year, approval is usually determined by adding the impact across all fiscal years. However, in some cases, the cost information for future fiscal years is presented only for informational purposes, and approval is determined by the cost change for only the current fiscal year. Because the criterion used to determine which level of approval is needed is not fully documented in the site's written procedures, change proposals moving similar amounts of resources may be approved at different levels of review.

<sup>5</sup>In this analysis, we did not review schedule change thresholds or their implementation.

The current procedures do not require that supporting documentation attached to the change proposals have the changes clearly marked to facilitate review. For example, when the scope of work for a project is being changed, forms detailing what work would be authorized if the proposal were approved are revised. However, the work scope forms had no indication of what was being changed. The identification of the change could only be made by comparing the revised form with the previous version. For some proposed changes, that task would not be onerous. However, for others affecting large segments of the site's work, the task could involve reviewing a large volume of documents (e.g., one rebaselining proposal had over 1,000 pages of supporting documentation). On occasion, one DOE manager has asked the contractor to mark the changes for rebaselining proposals.

Current procedures also do not require that the reasons for disapproval be documented on the change proposal. However, proposals that are disapproved at one level can be appealed to the next higher level board. In addition, without such information, the official record is incomplete and less useful for internal and external reviewers who are not present at board meetings. The Fernald Area Office agrees that documenting the reasons for disapproval would aid the review of appealed proposals.

DOE's Fernald Area Office officials agreed that clear and complete information on the change proposals would facilitate review. The incompleteness of the formal documentation highlights the degree to which the Fernald Area Office's managers rely on informal and verbal communications to support decision-making. However, the information provided through these informal channels is not part of the official record and, therefore, is not readily available for subsequent internal or external review. Improved procedures and quality of the documentation would facilitate DOE's oversight process and result in less reliance on informal communication for decision-making. Such changes would also provide a more complete official record of the changes that are made to the baseline.

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**Accounts for Properly  
Authorized Work May  
Appear to Have No Budget**

We did not find evidence in the accounts we reviewed to substantiate the allegation that charges were made against accounts that had no budget. Allegations were made that the contractor was performing unauthorized work on the basis of internal performance reports that showed actual charges against accounts that appeared to have no budget or in which actual charges exceeded the amounts budgeted. Although we identified



accounts in such reports that may appear to have no budget, the figures in the reports do not represent the amount of funds available in a given account. Rather, they reflect the agreed-upon performance goal for a given activity in a particular fiscal year. Therefore, the figures provide information on how the contractor performed against the goals, rather than evidence of unauthorized charges in accounts that have no funds. All of the accounts that we reviewed that appeared to have no budget (48 of 503) in fiscal years 1994, 1995, and 1996 through May 31, 1996, did, in fact, have budget.

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### **Some Weaknesses Exist in Financial Management System**

The contractor complied with most of the financial procedures and controls that we reviewed but did not comply with some others. In compliance with standard procedures, nearly all charges in the contractor's financial system occurred when accounts were properly opened for such charges. However, the contractor's financial system has accepted some charges against accounts that the control account manager had closed and has allowed some accounts to be reopened without the required control account manager's approval. Thus, control account managers, who are responsible for managing accounts and verifying the accuracy of charges, may not always be knowledgeable about the costs for which they are responsible for controlling. This can make it difficult for the managers to exercise effective control over costs, and thus ensure the accuracy of the data that DOE uses to assess the contractor's performance.

Accounts at Fernald relate to discrete segments of work, such as the treatment of waste water in a soil remediation project. When the work is scheduled to begin on such a segment, a control account manager requests that an account be opened, thus allowing costs for the work to be charged against the account. When the work on the segment is completed and the control account manager determines that all related charges have been made, the control account manager closes the account. This procedure is meant to ensure that a person knowledgeable about the scope of work and the related costs monitors and controls the charges that are made against the account. Control account managers discharge their duties by day-to-day oversight of work performed; by reviewing standard reports on labor, materials, and subcontract charges incurred to perform the work covered by their accounts; and by verifying charges against their accounts.

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### **Financial System Will Accept Charges Against Accounts That Are Closed**

Nearly all charges in the contractor's financial system occurred when accounts were properly opened in compliance with standard procedures. However, a small percentage of charges were routinely made to accounts

after the control account managers had closed them, making effective control of the accounts difficult. This percentage averaged from 1 to 2 percent of the several hundred thousand charges that Fluor Daniel Fernald processes annually to accumulate costs in its authorized accounts. The contractor recorded about 504,000 charges in fiscal year 1994, more than 650,000 in fiscal year 1995, and more than 512,000 in fiscal year 1996 through July, all of which we reviewed.

According to our analysis, from 0.9 percent of the charges in fiscal year 1994 to 2.4 percent in fiscal year 1996 occurred when the accounts were not properly opened to accept charges. Although the percentage of such charges is low, the charges have occurred on a regular basis. The dollar value of these charges ranged from a charge of \$905,902 to a credit of \$8 million. Furthermore, accounts can have multiple openings and closings as well as numerous charges after they have been closed. For example, two accounts that we judgmentally selected had multiple openings and closings (three in one case and five in the other) and showed numerous charges after the accounts were closed (363 charges in one case and 178 in the other). Therefore, once an account has been entered into the system, it requires constant monitoring to ensure that only appropriate charges are added to it after the control account manager has closed out the account.

The system will accept charges to closed accounts because, according to contractor officials, accounts are not considered permanently closed in order to allow for adjustments to be made. According to Fluor Daniel Fernald accounting personnel, charges might be made to a closed account when sales tax is allocated to accounts, which is done monthly rather than after each invoice is posted, and when employee benefits are periodically allocated. In addition, invoices may be entered into the system when they are received but not charged against the accounts until the invoice due date when they are paid.

The type of transactions posted to closed accounts has not changed over the period. Charges are categorized in one of three ways—labor, materials, or subcontract costs. The highest error rates in each year occurred in transactions for the purchase of materials. Although most of the 18 control account managers we interviewed told us that they focus on monitoring labor charges, the error rate for labor transactions has risen slightly during the period. However, control account managers were generally satisfied

with the timeliness of corrections to their accounts when they identified erroneous charges.<sup>6</sup>

Although the financial system accepted charges against closed accounts, our tests showed that it appropriately did not accept charges against accounts that were not in the system. That is, although the system would accept charges against an authorized account that had been closed, it would not do so against an unauthorized or fictitious account that had not been properly entered into the system.

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**Financial System Allows  
Accounts to Be Reopened  
Without Required Approval**

In addition to allowing charges to be made to closed accounts—without reopening them—the contractor's financial system at times allowed accounts to be reopened for charges without the required control account manager's approval. Fluor Daniel Fernald's procedures require that the responsible control account manager sign an open/close form for accounts to be opened or closed. Because control account managers are responsible for maintaining control over the performance of their accounts, they need to be aware of any charges to their accounts that affect the cost, scope, or schedule of work.

On the basis of our review of a sample of documents to open and close accounts, we estimate that 46 percent were missing at least one of the required documents.<sup>7</sup> In addition, an account was occasionally reopened solely on the basis of an electronic mail message from the Accounting Division requesting that the account be reopened. According to Fluor Daniel Fernald officials, this was done to facilitate the process of making corrections to charges already in the system, such as a labor charge posted to an incorrect account.

Three of the 18 control account managers we interviewed told us that, contrary to procedures, their accounts were reopened without their approval after they had determined that all charges had been received and formally requested that the account be closed. Several control account managers told us that they were not aware that their accounts had been reopened until after they saw new charges appear in their reports. The

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<sup>6</sup>While we did not independently verify the accuracy of the accounting transaction data, we reviewed the processes concerning the data (as discussed above), performed various data tests throughout the course of our computerized analysis, and worked closely with Fluor Daniel Fernald officials to ensure the accuracy of our results. In addition, results of our analysis were corroborated with oral testimony from Fluor Daniel Fernald's control account managers.

<sup>7</sup>See appendix V for detailed information on our control account sample and sampling error for this estimate.

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reopening of accounts without the control account managers' awareness and approval may make it difficult for the managers to effectively control what is charged to their accounts.

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## Some Weaknesses Remain in DOE's Oversight of the Contractor's Financial and Performance Systems

Recent reviews at Fernald made numerous recommendations and also identified some recurring weaknesses. DOE's managers have updated their procedures and directed Fluor Daniel Fernald to make changes to address the weaknesses identified by the reviews. However, the impact of some actions will take time to assess, and other actions are not yet complete. DOE's Special Project Team and the DOE Chief Financial Officer's team, reporting in March 1996, made more than 40 recommendations for improving financial and performance management. The Fernald Area Office's managers have been tracking progress in implementing the recommendations, which included the development of an integrated oversight plan for the site, strengthening the Fernald Area Office's oversight of baseline changes, and more effective use of the Ohio Field Office's financial oversight resources. Some of the recommendations have not yet been implemented.

Furthermore, we, the Special Project Team, and the Office of the Chief Financial Officer found that some previously identified problems have continued to occur. For example, a functional assessment of the contractor's Project Control System performed in October 1994 by DOE's Office of Field Management found that the system generally met DOE's requirements but made a number of recommendations for improvements to the system. However, several of these recommendations have not been effectively implemented.

We found that the Fernald Area Office did not require the contractor to prepare a formal corrective action plan and has not performed a follow-up review to ensure that the recommendations from the 1994 assessment were acted upon. Contractor officials stated that most of the recommendations have been addressed through their continuous improvement program. However, because there was no formal corrective action plan, it is difficult to assess directly exactly what was done or how effective the actions were in resolving the problems cited.

For example, the Office of Field Management recommended that the Fernald Area Office conduct comprehensive assessments of the contractor's accounting system and compliance with applicable procedures. While the Fernald Area Office has ascertained that the

contractor has written procedures governing key components of the Project Control System, such as opening and closing control accounts and charge numbers, it has not assessed the logic or implementation of those procedures. The Chief Financial Officer's Review reiterated this recommendation in March 1996. However, the Fernald Area Office has not performed the assessments and does not plan to do so until fiscal year 1998 at the earliest. Thus, the review will occur considerably after the date on which DOE will have to decide whether to offer Fluor Daniel Fernald's contract for competition or renew it.

Furthermore, one recommendation was to follow the baseline change control procedure that calls for the prompt updating of the baseline when fixed-price subcontracts are negotiated.<sup>8</sup> The Ohio Field Office's Office of the Chief Financial Officer has been conducting an audit of how well the contractor has followed that written procedure in general and has issued a report on one instance in which it was not followed. In that case, the contractor entered into a subcontract to dismantle Plant 7 at a cost of about \$5 million less than the estimated amount included in the baseline. Subsequently, the contractor did not process a proposal to change the baseline. As a result, the contractor's award fee for the period was based on the higher amount. The contractor later agreed to pay back \$135,000 of the fee received in that period.

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<sup>8</sup>In a fixed-price contract, the contractor agrees to deliver a specific product or service for an agreed-upon or fixed price. Thus, the cost of the work to the buyer is known once the contract is signed. In contrast, in a cost-plus contract, the cost of the work is not known until the work is finished and all costs are accumulated and billed to the buyer.

# DOE's Cost and Schedule Plans for Cleaning Up Fernald

DOE prepared a plan in early 1996, on the basis of future budget projections, for cleaning up the Fernald site in 10 years (ending in fiscal year 2005) and at a cost of about \$2.387 billion. Subsequently, because of reduced budget projections, DOE prepared and approved a replan that concluded that the Fernald cleanup will take 13 years and cost about \$2.374 billion (or about \$13 million less). A number of assumptions account for the \$13 million difference, such as a substantial cost reduction if more Fernald waste is disposed of on-site. The 3-year slippage will require renegotiation of certain EPA-mandated cleanup deadlines.

## Evolution of Fernald's Original 10-Year Plan and 10-Year Replan

As recently as early 1995, DOE estimated that it would take 25 years to clean up the Fernald site. Later in 1995, however, DOE headquarters proposed the possibility of accelerating the Fernald cleanup. Specifically, DOE headquarters advised Fernald Area Office managers to assume a budget of \$256 million for fiscal year 1996 and \$276 million for years thereafter, using a funding growth equal to inflation. In response to that guidance, Area Office managers prepared a plan in early 1996 that estimated that the site could be cleaned up in 10 years at a cost of about \$2.387 billion. Subsequently, DOE headquarters staff reviewed and approved the plan.

In June 1996, DOE advised Fluor Daniel Fernald that funding for Fernald cleanup may be less than anticipated. Specifically, DOE indicated that actual funding levels for fiscal years 1997 and 1998 may be \$266 million and \$264 million, respectively.<sup>1</sup> On the basis of that information, DOE requested that Fluor Daniel Fernald prepare an analysis that would identify any potential impacts to the 10-year plan. In response, Fluor Daniel Fernald initially estimated in July 1996 that it would require an additional year and approximately \$120 million more to clean up the Fernald site.

In August 1996, Fluor Daniel Fernald provided DOE with more specific recommendations on a 10-year replan strategy based on the lower funding levels provided. Specifically, the contractor recommended a path that called for the completion of work on four of the five operable units by the end of fiscal year 2005. Fluor Daniel Fernald estimated that the completion of work on operable unit 4 would take an additional 2 to 5 years. In October 1996, DOE approved Fluor Daniel Fernald's recommendations with one modification. The approved replan extends work completion on operable unit 4 by 3 years to a total of 13 years, or to mid-fiscal year 2008.

<sup>1</sup>Fernald's actual cleanup budget for fiscal year 1997 is about \$266.1 million.

Work on operable unit 4 was extended because of technical uncertainties associated with on-site waste vitrification.

In November 1996, Fluor Daniel Fernald provided us with a preliminary analysis of the cost to clean up Fernald under the approved 10-year replan. The analysis showed that the total cost to clean up Fernald by fiscal year 2008 will be about \$2.374 billion (or about \$13 million less than under the original 10-year plan). A number of assumptions, some representing cost increases and others representing cost decreases, account for the \$13 million difference. (See the discussion below.) Fluor Daniel Fernald officials also advised us that more definitive cost information, particularly for fiscal years 1999 and beyond, will be available in early 1997. DOE officials said that they are still committed to completing Fernald's cleanup by 2005, which could be accomplished by using advanced technologies or other means to improve the current schedule.

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## Differences Between the Original 10-Year Plan and the 10-Year Replan

Several different assumptions exist between the original 10-year plan and the 10-year replan. For instance, the original 10-year plan assumed compliance with all EPA-mandated deadlines to bring the site into compliance with the Resource, Conservation and Recovery Act and other regulatory requirements. However, the 10-year replan reflects a 3-year slippage in the cleanup of operable unit 4. According to DOE officials, this slippage will result, in the need to renegotiate certain EPA deadlines.

In addition, the original 10-year plan assumed the design and construction of a single full-scale vitrification plant in parallel with pilot plant operations. (See app. I.) The approved 10-year replan assumes that rather than having a single full-scale plant, several smaller-capacity vitrification units will be built after pilot plant operations are concluded. Fluor Daniel Fernald officials estimated that this approach will add about \$38 million to the cost of Fernald's cleanup.

Furthermore, the original 10-year plan assumed that all of the soil and debris associated with the former production area, also known as operable unit 3, would be shipped to DOE's Nevada Test Site. The approved 10-year replan assumes, instead, that most of this soil and debris will meet the waste acceptance criteria for the planned on-site soil disposal facility and will be placed in the on-site facility. Fluor Daniel Fernald officials estimated about a \$48 million reduction in the Nevada Test Site's disposal costs if that occurs.

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Finally, the original 10-year plan omitted the costs associated with groundwater collection and treatment beyond 2005. A June 1996 DOE complexwide cleanup report estimated that Fernald groundwater collection and treatment beyond 2005 would continue for another 13 years and cost about \$128 million.<sup>2</sup> The approved 10-year replan assumes that because of aggressive extraction and reinjection, groundwater collection and treatment can be completed by 2005.

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<sup>2</sup>Department of Energy: The 1996 Baseline Environmental Management Report (DOE/EM-0290, June 1996).



# Scope and Methodology

To obtain information on the major allegations reported by the Cincinnati Enquirer and the status of the investigations of these allegations, we began our work by grouping the allegations under general categories and interviewing the newspaper's staff to develop a perspective on the significance of these categories. We also interviewed DOE officials and Fluor Daniel Fernald officials responsible for investigating the allegations to determine the extent to which some potential problems had already been studied and the status of their investigations. Furthermore, we discussed the potential problem areas with state regulatory officials and with representatives of citizen advisory groups and Fernald trade unions to assess the general state of affairs at the site. Using this information, we proposed and obtained approval from our congressional requesters to focus the review on the allegations concerning (1) the vitrification pilot plant and uranyl nitrate hexahydrate projects, (2) safety and health incidents and DOE's oversight of the contractor's safety and health activities, and (3) the integrity of the major financial and performance management information systems used by DOE managers. We then obtained detailed information on these allegations and on DOE's and the contractor's programs in these areas to assess how DOE's management and oversight ensured that the contractor is effectively implementing cleanup activities and fulfilling DOE's safety and health requirements at the site.

As agreed with our congressional requesters, in focusing our work, we included only information contained in newspaper articles printed on or before May 31, 1996. In addition, we excluded several areas of allegations from further examination, primarily because those areas had already been investigated by an independent organization, such as DOE's Office of Inspector General, or because there was a general consensus among those we interviewed that the area was not a major problem. These areas included allegations concerning (1) DOE's workforce reduction activities and the reimbursement of the contractor's travel costs, (2) the contractor's plan to build a full-scale vitrification plant and the contractor's studies of the use of radium contained in waste that DOE planned to vitrify, (3) modifications to the contractor's computer programs used to report performance statistics, and (4) support and overhead costs at the site.

Throughout the review we invited individuals who might know about mismanagement at Fernald to confidentially provide us with supporting information. For example, we rented a post office box and met with representatives of employee groups to identify individuals who might have information for us. The Cincinnati Enquirer also published information about our review and ways to contact us by phone or mail. As a result of

these efforts, we met in Cincinnati with individuals who had been quoted by the newspaper and met with several contractor employees at Fernald. These individuals generally presented anecdotal information that helped explain the background for many of the allegations or information about grievances and other employee relations problems that directly involved them. We used this information to the extent possible to ask follow-on questions and obtain documents about the allegations from DOE and Fluor Daniel Fernald.

The following provides additional detail on the scope and methodology of our work concerning DOE's VITPP and UNH projects, the Department's safety and health program and alleged incidents at the site, and the Department's oversight of financial and performance management systems at Fernald. We performed this work from March 1, 1996, to January 31, 1997, in accordance with generally accepted government auditing standards.

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## DOE's VITPP and UNH Projects

To obtain detailed information on DOE's management and oversight of the VITPP project, we reviewed DOE's December 1995 investigation of operable unit 4 activities, which focused on the pilot plant project, and interviewed DOE officials who had either participated in the investigation or were responsible for managing past and current activities at VITPP. We tested the validity of this information by reviewing DOE's and Fluor Daniel Fernald's summaries of progress reports and briefings provided to DOE and the contractor's management during the design and construction of the pilot plant and by reviewing correspondence from DOE site managers, the contractor, state and federal regulators, and DOE headquarters managers during this time. We also reviewed (1) the findings of DOE's March 1996 special project team report on VITPP and other site activities discussed by the Cincinnati Enquirer, (2) the DOE-sponsored January 1996 value engineering study that discussed alternatives to DOE's current plans for the pilot and full-scale vitrification plants, and (3) the Department's correspondence to state and federal regulators that identified schedule delays at the pilot plant and DOE's response to these delays. We discussed the relationship between the pilot plant's current problems and those reported by the newspaper with DOE's program manager for VITPP and with senior DOE site managers.

To obtain detailed information concerning the UNH project, we reviewed the project-related findings of DOE's March 1996 report on the allegations and project files maintained by DOE and Fluor Daniel Fernald. We also interviewed key managers and construction workers involved in the

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project. These included (1) DOE's and Fluor Daniel Fernald's principal project managers; (2) the contractor's deputy project manager, construction contracts manager, and quality assurance inspector who had worked on the project; and (3) construction pipe fitters having experience with UNH.

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## Safety and Health Oversight and Incidents

To determine how DOE's management and oversight processes at Fernald ensure that Fluor Daniel Fernald is fulfilling DOE's safety and health requirements, we obtained and reviewed (1) DOE's safety and health procedures and guidelines applicable to the site, (2) the assessments of Fluor Daniel Fernald's safety and health activities done by DOE's Fernald Area Office, and (3) the assessments of the Fernald Area Office's safety- and health-related programs done by the Defense Nuclear Facilities Safety Board and by DOE headquarters' Office of Environment, Safety and Health and Office of Environmental Management. We also interviewed officials of the Defense Nuclear Facilities Safety Board, DOE's Ohio Field and Fernald Area Offices, and DOE headquarters' ES&H and EM about the management and oversight processes.

To determine the number of significant safety and health problems at the Fernald site, we reviewed reports from DOE's Occurrence Reporting and Processing System that Fluor Daniel Fernald prepared from January 1, 1993, to February 12, 1996. To obtain additional information about safety and health problems at the site, we obtained and reviewed (1) assessments, procedures, orders, surveys, and other documents prepared by DOE's ES&H, DOE's Fernald Area Office, Fluor Daniel Fernald, and outside consultants and (2) the safety-related findings of DOE's March 1996 investigation of the allegations. We also interviewed the Fernald Area Office's safety and health officials at Fernald about their safety and health activities.

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## Performance and Financial Systems

To assess Fluor Daniel Fernald's performance and financial systems at Fernald, we focused on three major areas: (1) the control of the performance measurement baseline against which Fluor Daniel Fernald's performance is measured, (2) internal controls applicable to financial management practices, and (3) how these aspects of Fluor Daniel Fernald's internal controls could affect the effectiveness of the Fernald Area Office's oversight of the contractor's activities and performance.

To conduct this work and to gather information on DOE's and the contractor's response to previous studies,<sup>1</sup> we interviewed numerous senior DOE and Fluor Daniel Fernald officials. These officials included the Manager, Acting Chief Financial Officer, and Team Leader of the Chief Financial Officer's Financial Review Group within DOE's Ohio Field Office and the Director, Deputy Director, Associate Director for Environmental Management, Associate Director for Safety and Assessment, and several Activity Data Sheet Managers of DOE's Fernald Area Office. At Fluor Daniel Fernald, we interviewed the president, director and staff of the project integration and controls division, the director of the environmental management division, senior officials in the accounting division, the change control manager, and several control account managers.

## Performance Measurement Baseline

We identified a universe of 985 baseline change proposals from fiscal year 1994 through May 31, 1996. We selected a stratified random sample of 176 baseline change proposals for a detailed review of compliance with Fluor Daniel Fernald's and the Fernald Area Office's written procedures for the preparation and processing of baseline changes. Our sample was stratified by fiscal year and type. (See table VI.1.) The sample included all of the disapproved change proposals in each year and all of the change proposals still in process as of May 31, 1996.

Table VI.1: Baseline Change Proposal  
Universe and Sample

Type of change proposal	Total change proposals			Change proposals in sample		
	Fiscal year 1994	Fiscal year 1995	Fiscal year 1996	Fiscal year 1994	Fiscal year 1995	Fiscal year 1996
Approved	380	233	86	20	20	20
Cancelled	129	80	19	20	20	19
Disapproved	13	20	1	13	20	1
In process	0	0	23	0	0	23
Tabled	0	0	1	0	0	0
<b>Totals</b>	<b>522</b>	<b>333</b>	<b>130</b>	<b>53</b>	<b>60</b>	<b>63</b>

We sampled 176 baseline change proposals. Of the 176 proposals in the sample, 115 had completed forms. Fifty-nine of the proposals in the canceled and in-process categories had no completed forms at the time our sample was drawn. Lastly, we identified two proposals as missing from our data set. However, because of the lapse of time before we

<sup>1</sup>The major studies were the DOE headquarters Office of Field Management's fiscal year 1994 functional assessment of its Project Control System and the 1996 DOE Special Project Team and Fluor Daniel investigation of the Cincinnati Enquirer's allegations.

discovered they were missing, we determined that we would not be able to get data that would be comparable to the data from the rest of the sample and dropped them from the analysis.

Since we used a sample (called a probability sample) of baseline change proposals to develop our estimates, each estimate has a measurable precision or sampling error, which may be expressed as a plus/minus figure. A sampling error indicates how closely we can reproduce from a sample the results that we would obtain if we were to take a complete count of the universe using the same measurement methods. By adding the sampling error to and subtracting it from the estimate, we can develop upper and lower bounds for each estimate. This range is called a confidence interval. Sampling errors and confidence intervals are stated at a certain confidence level—in this case, 95 percent. For example, a confidence interval at the 95-percent confidence level means that in 95 out of 100 instances, the sampling procedure that we used would produce a confidence interval containing the universe that we are estimating. (See table VI.2.)

**Table VI.2: Sampling Errors at 95-Percent Confidence Level for the Baseline Change Proposal Sample**

Estimated data on baseline change proposals	Estimate	Sampling error at 95-percent confidence level
Number of baseline change proposals with completed forms as of May 31, 1996	804.0	+/- 28.0
Percentage of proposals with clear narrative description of scope of change	99.1	+/- 0.9
Percentage of proposals with clear narrative justification of change	95.5	+/- 3.3
Percentage of proposals with clear narrative analysis of impact	84.0	+/- 5.2
Percentage of proposals without all required funding information	11.9	+/- 5.9

In addition, we reviewed the entire database of 985 change proposals for indications that several small proposals may have been processed instead of submitting one larger proposal that would have required DOE's approval. We examined our sample of baseline change proposals to assess whether the narrative description of the change, justification for the change, and impact of the change were clear and understandable without additional verbal explanation. To do this, we examined the formal documentation for these changes, including any supporting documents. We also checked whether the source of additional funding was identified on the documents

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as required in Fluor Daniel Fernald's Change Control Procedure (SSOP-5030). Finally, we compared the data shown on the sample change proposals with the data recorded in Fluor Daniel Fernald's change proposal database for their accuracy and completeness.

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### Internal Controls Applicable to Financial Management Practices

To determine whether actual costs were being charged to accounts without associated budget allocations, we examined the contractor's cost performance report data from fiscal year 1994 through May 31, 1996. We identified all accounts with charges of at least \$10,000 for which the budget at the completion field was zero and discussed the reasons for these occurrences with Fluor Daniel Fernald's project controls management personnel.

To test Fluor Daniel Fernald's procedures for opening and closing control accounts and charge numbers, we reviewed the available documentation of account openings and closings. We selected a random sample of 87 control accounts and reviewed all of the 239 associated charge numbers. Since we used a sample (called a probability sample) of control accounts to develop our estimates, each estimate has a measurable precision, or sampling error, which may be expressed as a plus/minus figure. Our estimate of 46 percent of the charge numbers missing at least one of the required open or close documents has an associated sampling error of 12 percent.

In addition, we compared the available documentation with the contractor's computerized charge master file (a record of every time that each account was opened or closed) to determine if the documentation that should have been present under the contractor's procedures for opening and closing was complete. On two occasions, we observed the contractor's personnel locating the required documentation for specific accounts. On another occasion, we observed contractor officials at our request attempting to enter transaction data to erroneous accounts to verify that the system would not accept charges to accounts not already in the system. Finally, we interviewed 18 of the contractor's control account managers about their experiences with opening, closing, reopening, and correcting accounts. We selected the control account managers for our interview on the basis of the number of open accounts that they were responsible for as of May 1996 as reported in the contractor's charge master file. We did this to ensure that we interviewed control account managers from each activity data sheet (or major work area) at the site.

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To test the contractor's internal control procedures for accumulating actual costs in their accounting and performance reporting systems, we examined a database of Fluor Daniel Fernald's accounting transactions from fiscal year 1994 through July 31, 1996. The database originally contained 737,055 records for fiscal year 1994, 882,965 records for fiscal year 1995, and 650,189 records for fiscal year 1996. We dropped 233,201 of the fiscal year 1994 records, 228,723 fiscal year 1995 records, and 138,168 fiscal year 1996 records that represented general ledger accounting transactions rather than actual costs from the database. This left 503,854 records for fiscal year 1994, 654,242 records for fiscal year 1995, and 512,021 records for fiscal year 1996.

We compared each of those records against the charge master data detailing when each control account and charge number was properly opened to accept charges and identified all instances in which the transaction date fell outside of the valid time period for charges to be processed against each account. We interviewed Fluor Daniel Fernald personnel in the project controls and integration and accounting divisions to ascertain how and why charges were made to accounts that were closed.

To assess management support for following internal control procedures, we interviewed 18 control account managers. We asked them questions about their experience, their training, their overall management support for following procedures, their tools and techniques for reviewing charges to their accounts and resolving mischarges, and areas for improvement in project management; whether problems identified by the company in fiscal year 1994 with mischarges to accounts continue; and whether they have been asked to do work in advance of formal authorization.

# Comments From the Department of Energy



Department of Energy  
Washington, DC 20585

February 28, 1997

Mr. Victor Rezendes  
Director  
Energy, Resources, and Science Issues  
General Accounting Office  
441 G Street, N. W.  
Washington, D.C. 20548

Dear Mr. Rezendes:

Thank you for the opportunity to comment on the draft report on the "Management and Oversight of Cleanup Activities at Fernald." We have carefully reviewed the report and the specific recommendations it makes.

We are concerned that the summary sections of the draft report (the first twenty pages) do not bring closure to the reasons for the General Accounting Office investigation, which are the key issues raised by the *Cincinnati Enquirer* in their "Danger and Deceit" series. These key issues are (1) has the site "jeopardized the safety of site workers and neighbors" and (2) is the "government being systematically cheated out of millions of dollars?" Our concern is heightened by the fact that the General Accounting Office report will not only be used by Congress but also our neighboring stakeholders and taxpayers to assess the general state of the Fernald Environmental Management Project cleanup.

In order to bring closure to these key issues, we recommend that the comments we have provided for the "Results in Brief" section (Enclosure 1) be considered for inclusion in the final report. The remaining enclosure to this letter (Enclosure 2) addresses our additional concerns and provides summary and detailed comments regarding the draft report and its appendices. We also have included timelines showing the reasons for the cost increases for the Vitrification Pilot Plant and the Uranyl Nitrate Hexahydrate projects.

Concerning your first recommendation on contract reform, the Fernald contract was modified in 1994 and 1995 to incorporate contract reform initiatives. I will convene a review panel to consider (1) options regarding the exercise of the 1-3 year option; (2) the schedule for the recompetition of the contract; and (3) the opportunity to integrate additional contract reform initiatives. Considering your second recommendation, while improvements have been made in the Department's oversight at Fernald, we will continue to focus attention and strengthen this area.

Before the report is finalized, we would appreciate the opportunity to meet with you to discuss our response.



Appendix VI  
Comments From the Department of Energy

If you have any further questions, please contact me or have a member of your staff contact Mr. Dave Berick, Office of Congressional, Public and Intergovernmental Affairs, at (202) 586-3354.

Sincerely,

A handwritten signature in cursive script that reads "Alvin L. Alm".

Alvin L. Alm  
Assistant Secretary for  
Environmental Management

2 Enclosures

ENCLOSURE 1

COMMENTS TO RESULTS IN BRIEF

We believe that the "Results in Brief" contained in the draft report do not accurately reflect the body of the report and the appendices. In order to add balance and clarity, we request that the "Results in Brief" address the following points:

Major Areas of Review:

1. The extent to which DOE provided effective management and oversight of two key cleanup projects at Fernald -- the Vitrification Pilot Plant Project and the Uranyl Nitrate Hexahydrate Project

- During the early stages of the Vitrification Pilot Plant (VitPP) and Uranyl Nitrate Hexahydrate (UNH) projects, the Fernald site was transitioning from an M&O contractor to the new Environmental Restoration Management Contract (ERMC) concept. The ERMC concept was a contract reform initiative to move from the traditional M&O approach used in weapons production to the ERMC approach used for cleanup projects by commercial firms. It was expected for DOE to have limited oversight and rely on the management and technical expertise of the contractor to accomplish the cleanup. Over time we recognized that more direct oversight was required than previously envisioned under the original ERMC concept. Consequently, DOE exercised increased oversight, initiated an investigation into problems with the VitPP, and responded to concerns identified.

Technical complexities resulting from the research and development nature of this pilot project also contributed to schedule and cost growth for the vitrification project. The complexities led to underestimates of melter operating efficiency, procurement delays, and equipment interface difficulties requiring additional design and construction.

Enclosed is a timeline outlining the pilot plant cost growth from \$14.1 to \$66 million. Also, in addition, DOE completed the UNH project safely, ahead of schedule, and without incidents of false performance claims by the contractor.

2. DOE's oversight of safety and health activities at the site from 1992 to present

- Since 1992, DOE has shown continuous improvement in its safety and health oversight program at Fernald by increasing the size of its safety program, and the number of assessments, enhancing the professional expertise of its staff, and improving the formality and rigor of its safety oversight program to ensure that the contractor is adhering to requirements. Since 1994, activities have been underway to significantly improve the structure of the safety program and the site culture and the ways in which work is planned and performed. In June 1996, the Office of Oversight, Environment, Safety and Health

conducted an independent evaluation of ES&H and concluded that the "Results of the Evaluation indicate that safety management at Fernald is effective ... [and DOE] has established approaches and initiatives that have resulted in sound and improving safety performance."

3. The contractor's compliance with certain performance and financial system procedures

-- There was no evidence in Appendix III of the GAO draft report to substantiate the allegations that charges were made to cost accounts with no budget. All accounts which were reviewed for fiscal years (FY) 1994, 1995, and 1996 were authorized and funded. Tests which were completed on the accounting system showed that it was functioning properly. A DOE independent review of the project management and control systems at the FEMP found the systems to be adequate to plan the project and monitor cost and schedule progress. A 1996 DOE Headquarters Chief Financial Officer Review of selected financial activities at the FEMP found that strong controls appear to be in place in planning and estimating the cost, scope and schedule of the work to be performed through its use of a baseline and project control system.

4. The major Cincinnati Enquirer allegations and what is known about them, including the results of the two primary investigations of the allegations

-- The major allegations of the "Danger and Deceit" series, with respect to safety and contractor financial/performance systems, were not substantiated in the GAO draft report.

5. The facts surrounding Fluor Daniel Fernald's recent announcement that it may take 12 to 15 years to complete the cleanup, rather than the previous agreed-upon ten years

-- DOE prepared an accelerated cleanup plan in early 1996. This plan, which was based on future budget projections at that time, completed the FEMP cleanup in fiscal year 2005 and cost about \$2.387 billion. A revised plan was completed in the fall of 1996 in response to reduced budget projections. The revised plan projected cleanup by 2008 and cost about \$2.374 billion. However, DOE and the Ohio Field Office remain committed to finding additional cost savings in order to complete the cleanup in the year 2005.